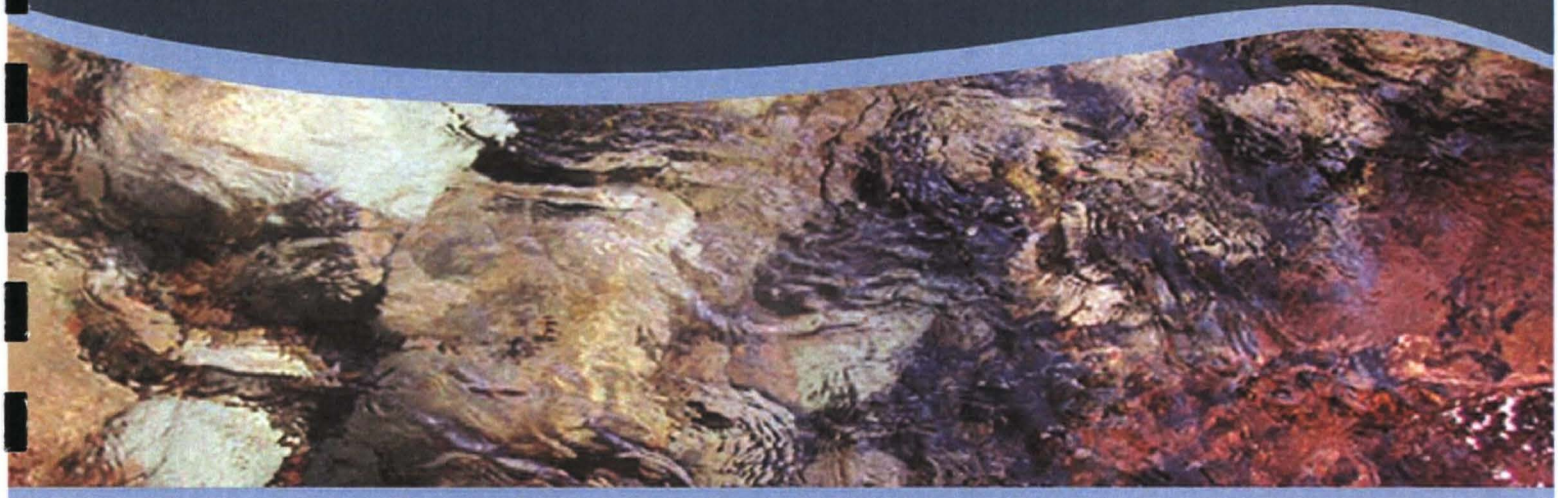
LDW | 0541 | JFOS | 12/01/2010

REPORT

ANCHOR QEA



HISTORICAL 6-INCH AND 12-INCH LATERAL PIPES INVESTIGATION REPORT

STORMWATER SOURCE CONTROL IMPLEMENTATION

JORGENSEN FORGE FACILITY, SEATTLE, WASHINGTON

Prepared for

Jorgensen Forge Corporation

Prepared by

Anchor QEA, LLC

December 2010

HISTORICAL 6-INCH AND 12-INCH LATERAL PIPES INVESTIGATION REPORT

STORMWATER SOURCE CONTROL IMPLEMENTATION

JORGENSEN FORGE FACILITY, SEATTLE, WASHINGTON

Prepared for

Jorgensen Forge Corporation

8531 East Marginal Way South

Seattle, Washington

Prepared by

Anchor QEA, LLC

1423 Third Avenue

Seattle, Washington 98101

December 2010

TABLE OF CONTENTS

List of Photos

List of Tables

List of Figures

List of Appendices

1 INTRODUCTION

This Historical 6-inch and 12-inch Lateral Pipes Investigation Report (Investigation Report) presents a summary of the recent investigation activities (the Investigation) conducted on the Jorgensen Forge Corporation's (Jorgensen Forge's) property, located at 8531 East Marginal Way South in Seattle, Washington (Jorgensen Forge Property; Figure 1), to evaluate stormwater lateral lines identified during previous investigations. This Investigation Report briefly describes the background of the Jorgensen Forge Property, summarizes relevant previous investigations, describes the Investigation activities, and presents the Investigation results and conclusions.

The Boeing Company (Boeing) Plant 2 Facility (Plant 2) is located north of the Jorgensen Forge Property. Two stormwater outfalls lines, which have been previously referred to as the 24-inch Property Line Pipe (24-inch Pipe) and the Boeing 15-inch Property Line Pipe, run parallel to each other on the Jorgensen Forge Property immediately adjacent to the property line for Plant 2 (Figure 2). Both stormwater outfall lines discharge to the Lower Duwamish Waterway (LDW) along the northwest corner of the Jorgensen Forge Property.

Previous investigations conducted at Plant 2 by Boeing in 2004 identified that a 6-inch-diameter lateral stormwater pipe (6-inch Lateral) extends from Boeing Storm Drain Manhole (SDMH) 36-83 in a southeasterly direction and terminates at shallow depth prior to crossing the Jorgensen Forge Property line (Figure 3; Floyd | Snider and Weston Solutions, Inc. 2005). Previous Boeing reports have assumed that the 6-inch Lateral originated on the Jorgensen Forge Property, but no additional investigation activities were conducted to verify this assumption.

Previous investigations by Boeing and Jorgensen Forge also identified a 12-inch-diameter lateral stormwater pipe (12-inch Lateral) that originates on the Jorgensen Forge Property and enters the 24-inch Pipe (Figure 2). The laboratory analytical results of solids samples collected from the 24-inch Pipe and 12-inch Lateral during previous investigations have detected concentrations of polychlorinated biphenyls (PCBs). The detected concentrations of PCBs in solids samples collected from the 12-inch Lateral were significantly lower than those identified in the 24-inch Pipe and have been attributed to tidal flushing. Additional

investigation has not been conducted to evaluate the extent of the 12-inch Lateral on the Jorgensen Forge Property or to evaluate the presence and distribution of PCBs within the full extent of the 12-inch lateral.

1.1 Purpose of the Investigation

The purpose of the Investigation was to:

1. Determine whether the 6-inch Lateral extends onto the Jorgensen Forge property and if so, how far and from where it extends
2. Assess the extent of the 12-inch Lateral to the south of the known extent on the Jorgensen Forge Property
3. Further characterize the distributions of PCBs within the 12-inch Lateral

1.2 Background

In 2001, an infrastructure project by Boeing in the southwest corner of Plant 2 identified PCB-impacted soil adjacent to and between the former Seattle City Light transformer substation on Plant 2 (Figure 2) and the fence line marking the boundary between Plant 2 and the Jorgensen Forge Property. A phased environmental investigation was conducted by Boeing to define the nature and extent of PCB impacts. The results of this investigation were summarized in the *Phase 1 Transformer PCB Investigation Report* (Floyd Snider McCarthy, Inc. 2004), which concluded that the stormwater conveyance system serving the transformer and wider area was a completed pathway for PCBs to LDW sediments.

Due to this completed pathway, Boeing conducted further soil sampling in the wider area and solids sampling from the three nearby storm drainage systems: the Plant 2 drainage systems, the Boeing 15-inch Property Line Storm Pipe, and the 24-inch Pipe (Figure 3). The results of this investigation were summarized in the *Phase 2 Transformer Investigation Report* (Floyd | Snider and Weston Solutions 2005) and showed elevated soil PCB concentrations in solids within all three systems.

Elevated concentrations of PCBs were detected throughout the 24-inch Pipe, including in a solids sample (SD005; Figure 2) collected from the base of the manhole location just downgradient from the previously unidentified 12-inch Lateral connection to the 24-inch

Pipe (SDMH 24A; Figure 2). A subsequent investigation of the 12-inch Lateral was conducted in 2005 by Farallon Consulting, LLC (Farallon). The analytical results of solids samples collected from the 12-inch Lateral near the connection point to the 24-inch Pipe (12SD-070105-01; Figure 2) and approximately 40 feet upgradient of the connection point (12SD-070105-02; Figure 2) detected much lower PCB concentrations than those detected in solids samples collected from the manhole. The concentrations of PCBs detected in the 12-inch Lateral were attributed to tidal flushing; Farallon concluded that the detected concentrations of PCBs do not indicate that the 12-inch Lateral is a source of PCBs to the 24-inch Pipe (Farallon 2005).

The results of the previous investigation activities have compared the detected concentrations of PCBs to the Sediment Management Standards (SMS) Second Lowest Apparent Threshold Screening Level (2LAET; 1,000 micrograms per kilogram dry weight [µg/kg dw]; PTI 1988) for Total PCBs (Figure 2). To maintain consistency with these previous investigations, the analytical results of the Investigation were also compared to the 2LAET for Total PCBs (Figure 2).

1.2.1 Description and History of 6-inch Lateral

The 6-inch Lateral connection from the Boeing system at SMDH 36-83 is described in the *Phase 2 Transformer Investigation Report* (Floyd | Snider and Weston Solutions 2005). The description is included here:

"For the system serving SDMH 36-83, the following observations were made:

- "A [6-inch Lateral] leading into SDMH 36-83 [presumably] from the Jorgensen Forge was discovered. All other pipes within this manhole originated at the [Plant 2] Facility and run in the direction expected (from recent Boeing Facility drawings).
- "PCB concentrations are elevated (590,000 µg/kg [micrograms per kilogram] PCBs) in both this pipe and the solids at the base of the manhole [CB009] (151,000 µg/kg PCBs).
- "As compared to the elevated PCB concentrations within SDMH 36-83, concentrations are significantly lower (less than 5,000 µg/kg PCBs) in the stormwater trough and vault draining to this manhole, as well as the Boeing catch basins

surrounding the substation, and in SDMH 36-705 (which has received discharges from SDMH 36-83 since 1994).

- "All of the storm pipes leading into SDMH 36-83 are inactive (i.e., do not currently drain stormwater). Except for the limited amount of surface water entering into this manhole from the stormwater trough and vault, this manhole has been inactive since 1994 when it was rerouted to discharge to Outfall 9A."

Figure 3.7 of *Phase 2 Transformer Investigation Report* (reproduced as Figure 3 of this Investigation Report) displays all of the PCB concentrations and shows that the 6-inch Lateral was located at 20 inches below ground surface on Plant 2, just north of the Jorgensen Forge Property line.

Following completion of the *Phase 2 Transformer Investigation Report* (Floyd | Snider and Weston Solutions 2005), Anchor QEA, LLC, conducted a review of aerial photographs dating from initial operations at the Jorgensen Forge Property in the mid-1940s to the present. Throughout this period, there were no structures on the Jorgensen Forge Property in close proximity to the area where the 6-inch Lateral terminated on Plant 2. Alternatively, Building 2-72 was located on Plant 2 in the direct vicinity of the termination location and could have contributed discharges to the 6-inch Lateral (Figure 3).

The *Phase 2 Transformer Investigation Report* and review of the aerial photographs indicate that the 6-inch Lateral did not originate from the Jorgensen Forge Property, contrary to the conclusion presented in the *Phase 2 Transformer PCB Investigation Report* (Floyd | Snider and Weston Solutions 2005) and subsequent documents referencing this same conclusion. The 6-inch Lateral evidently served a historical Plant 2 structure and/or drainage area.

1.2.2 Description and History of 12-inch Lateral

Development of Plant 2 and the Jorgensen Forge Property began in the mid-1940s during World War II and led to the installation of several pipes along the boundary between the two properties, including the 24-inch Pipe, which drained:

- A portion of the south side of Plant 2
- A portion of the Boeing Field Airport

- A portion of the historic Bethlehem Steel Facility located on the Jorgensen Forge Property

In 1996, the City of Tukwila (City) began discharging stormwater runoff to the 24-inch Pipe that was captured from catch basins located along East Marginal Way South.

Following identification of the 12-inch Lateral connection to the 24-inch Pipe during the *Phase 2 Transformer Investigation Work Plan* (Floyd | Snider and Weston Solutions 2004) activities, Farallon (on behalf of Jorgensen Forge) comprehensively reviewed Jorgensen Forge's files in attempt to find information about the 12-inch Lateral. No information was found.

The 12-inch Lateral is located on a portion of the Jorgensen Forge Property that historically served the Bethlehem Steel Facility from 1951 to 1963; therefore, it is believed that the Lateral also served this facility. On behalf of Jorgensen Forge, Farallon conducted sampling in 2005 to characterize the PCB concentrations in solids residing within the 12-inch Lateral. A sample was collected from within the 12-inch Lateral just upgradient from the connection to the 24-inch Pipe and just downgradient from a piece of dimensional lumber that is located approximately 40 feet upgradient of the connection.

The results of this additional characterization were summarized in a technical memorandum titled "Storm Drain Line Data Summary" (Farallon 2005). The memorandum reported that concentrations of Total PCBs detected in the samples collected by Farallon from the 12-inch Lateral ranged from 1,100 milligrams per kilogram (mg/kg) collected approximately 6 inches from the connection from the 24-inch Pipe to 6.5 mg/kg collected approximately 40 feet upgradient of the connection with the 24-inch Pipe (Figure 2). At the time of the characterization, no additional activities were implemented to determine the full extent of the 12-inch Lateral.

1.2.3 Regulatory Source Control Actions

King County (County) discharged stormwater to the 24-inch Pipe from portions of the King County International Airport from 1942 to late 2009 and the City continues to discharge

stormwater runoff to this Pipe from a portion of East Marginal Way South. Variable detected concentrations of Total PCBs ranging from 0.23 to 213 mg/kg have been identified in stormwater structures conveying runoff to the 24-inch Pipe (Floyd | Snider and Weston Solutions 2005) on King County International Airport, in catch basins on East Marginal Way South managed by the City, and in a manhole on City property located adjacent to East Marginal Way South.

On December 7, 2008, the Washington State Department of Ecology (Ecology) issued a Notice of Violation (NOV; No. 6180) to the County and the City for these discharges through an area of known contamination in the 24-inch Pipe (Ecology 2008). The County and the City jointly responded to the NOV, stating that they were not responsible for any remedial action of the downgradient portion of the 24-inch Pipe located on the Jorgensen Forge Property (King County and City of Tukwila 2008). In 2010, Ecology transferred oversight of the 24-inch Pipe cleanup actions to the U.S. Environmental Protection Agency (EPA) Office of Emergency Response. Mike Sibley, who manages this cleanup on behalf of the EPA Office of Emergency Response, approached Boeing, the County, the City, and Jorgensen Forge to:

1. Cease stormwater discharges from the Pipes to the LDW
2. Remove the solids residing in the Pipes

Boeing and Jorgensen jointly developed and submitted a *15-inch and 24-inch Property Line Storm Pipes Cleanup Work Plan* (Anchor QEA and Floyd | Snider 2010) to EPA on July 16, 2010, which documented the procedures proposed to achieve these objectives and report on those activities once these objectives are achieved.

1.3 Investigation Report Organization

The remainder of this Investigation Report is organized into the following sections:

- Section 2 – Summary of Recent 6-inch and 12-inch Lateral Field Activities
- Section 3 – Conclusions

2 SUMMARY OF RECENT 6-INCH AND 12-INCH LATERAL FIELD ACTIVITIES

The following sections summarize the most recent Investigation of the 6-inch and 12-inch Laterals conducted in May 2010. The Investigation was conducted by field personnel from Anchor QEA in coordination with selected contractors Glacier Environmental Services, Inc. (Glacier) and Applied Professional Services, Inc. (APS). The Investigation activities were completed using the applicable quality assurance/quality control (QA/QC) and field sampling procedures identified in the EPA-approved *Second Draft Environmental Sampling Work Plan* (Farallon and Anchor Environmental 2004).

2.1 Investigation of 6-inch Lateral

The location of the SDMH 36-83 and southeasterly direction of the 6-inch Lateral were visually approximated from the Jorgensen Forge Property using Figure 3 and the location of SDMH 36-83, which is visible from the Jorgensen Forge Property fence line (Photo 1). Following confirmation of no underground utilities, Glacier excavated an approximately 3-foot-wide, 15-foot-long, and 4-foot-deep trench in the soil directly parallel to the fence line on the Jorgensen Forge Property, in the area where the 6-inch Lateral was purported to extend onto the Jorgensen Forge Property at a depth of less than 20 inches below ground surface (see Section 1.2.1). The soil type observed within the trench was consistent with the soil type observed in surrounding soil borings that were collected during previous investigations and is not indicative of fill material. The 6-inch Lateral was not identified in the excavation (Photos 1 and 2), so no additional investigation activities (for example, sample collection) were conducted. The excavation was returned to grade using imported fill material. The excavated material was characterized for disposal suitability and transported offsite and disposed at a permitted disposal facility.

2.2 Investigation of 12-inch Lateral

Glacier completed an excavation to expose the portion of the 12-inch Lateral just upgradient of the dimensional lumber that was previously identified within the Lateral during the 2005 Farallon characterization (see Section 1.2.2). This excavation is labeled as "Excavation Area #1" on Figure 4. The soil type observed within the excavation was consistent with the soil type observed in surrounding soil borings that were collected during previous investigations and is not indicative of fill material.

Shoring was placed in the excavation, and Anchor QEA collected a sample of soil directly overlying the 12-inch Lateral using a decontaminated stainless steel spoon. The sample was placed in a decontaminated stainless steel bowl and homogenized. Following homogenization, the sample was placed into pre-cleaned laboratory supplied labeled jars that were then placed into a sealed bag and put in a cooler with ice. All subsequent soil samples discussed in this Investigation Report were collected using these same procedures. The 12-inch Lateral (made of clay) was then broken to inspect for the presence of solids and to facilitate video reconnaissance within the Lateral. The 12-inch Lateral was discovered to be a 10-inch clay pipe rather than the previously reported 12-inch concrete pipe. (This Investigation Report will continue to refer to this pipe as the 12-inch Lateral for consistency.) No solids were observed within the Lateral at the access point prohibiting sample collection. Because no solids were collected from within the 12-inch Lateral, the overlying soil sample was archived at the laboratory and not submitted for chemical analysis.

APS performed a video reconnaissance of the 12-inch Lateral using a video tractor equipped with a sonde locating device. The video tractor was inserted into the Lateral via the Excavation Area #1 (Figure 4), oriented to proceed south (upgradient), and traversed 31 lineal feet upgradient from the access point, where the Lateral was plugged. The tractor's sonde was located and marked on a concrete pad between two above-ground rail spurs and an adjacent building (see Photo 3 and Figure 4). No lateral connections were identified entering the 12-inch Lateral within this distance. The video reconnaissance findings of the 12-inch Lateral are presented in Appendix A.

The video reconnaissance tractor was then re-inserted into the 12-inch Lateral via Excavation Area #1, oriented to the north (downgradient), and traversed 9.7 lineal feet before contacting the dimensional piece of lumber previously identified by Farallon during the 2005 investigation (Appendix A). No lateral connections were identified in the 12-inch Lateral within this distance. The bottom interior of the 12-inch Lateral within Excavation Area #1 was measured to be 7 feet below ground surface, as measured from the adjacent slab. PLS, Inc., surveyed the adjacent slab locations (Appendix B); the bottom of the Lateral pipe's elevation is 13.59 feet mean lower low water (MLLW). The area where the 12-inch Lateral was broken was then filled with concrete and allowed to cure overnight prior to backfilling with imported fill. This concrete plugged the 12-inch Lateral at the access point.

Additional work was completed to attempt to access the upgradient termination point that was identified within the 12-inch Lateral during the video reconnaissance. Glacier removed a portion of the concrete slab where the sonde was located to facilitate excavation of the underlying soil to access the Lateral. This excavation is labeled as "Excavation Area #2" on Figure 4. The soil type observed within the trench was consistent with the soil type observed in Excavation Area #1 and in surrounding soil borings that were collected during previous investigations and is not indicative of fill material. Glacier completed the soil excavation down to an elevation just above the Lateral, taking care not to undermine the adjacent rail spurs or building. Trench shoring was installed in the excavation, and a single soil sample was collected from just above the 12-inch Lateral and submitted for analysis of total solids, total organic carbon (TOC), metals, PCBs, and polycyclic aromatic hydrocarbons (PAHs).

The small height of additional soil overlying the 12-inch Lateral was then manually removed by shovel to expose the Lateral without damage. At the north end of the excavation, a soil overhang was caused by the intact rail lines (Figure 3). To the extent possible without undermining the rail lines, a small amount of additional soil was excavated under the overhang to expose the bell connection of two sections of the 12-inch Lateral (Photo 4 and Figure 4). Visual observation of the bell indicated that a thin layer of black gasket material mated the two sections of the Lateral. The bell of the 12-inch Lateral was broken with a steel rod and two samples of gasket material from approximately opposite sides of the bell were collected and submitted for analysis of total solids, TOC, PCBs, and PAHs. The gasket samples were black, dense, plastic solids. A push-camera was then inserted into the Lateral at the bell location and pushed down gradient to successfully identify the plugged 12-inch Lateral (Excavation Area #1 on Figure 4). The video reconnaissance findings of the 12-inch Lateral are presented in Appendix A.

Soil was then removed by shovel from the south end of Excavation Area #2 to expose the 12-inch Lateral termination point. This exposed an area where the top of the 12-inch Lateral was cracked (Photo 5) adjacent to a grout and soil plug (Photo 6). The soil type encountered was consistent with the surrounding and overlying soil type. A single soil sample was collected from just above the Lateral and submitted for analysis of total solids, TOC, metals, PCBs, and PAHs. To the extent possible without undermining the overlying building,

additional soil was excavated several feet to the south of the plug to determine if the 12-inch Lateral re-initiated further upgradient (Photo 7). No additional pipe was observed indicating the grout and soil plug was the termination point of the 12-inch Lateral. This location is approximately 18 inches west (outside) of the remnant stub wall (Photo 8) from the former Bethlehem Steel Facility building visible in aerial photographs, providing evidence that the 12-inch Lateral did not enter that building. The bottom interior of the Lateral was measured to be 6.8 feet below ground surface, as measured from the adjacent concrete slab. PLS, Inc., surveyed the adjacent slab locations (Appendix B); the bottom of the Lateral pipe's elevation is 13.76 feet MLLW. The aerial extents of the Excavation Area #2 are shown in Photo 8.

The 12-inch Lateral was then broken with a hammer just downgradient from the grout and soil plug. A small amount of black, dense, and plastic intact solid was observed within the 12-inch Lateral just downgradient from the grout and soil plug. This material was similar in nature to the gasket material identified at the downgradient bell discussed above. The material was solidified to the bottom of the 12-inch Lateral and was shown to encapsulate soil upon probing. The encapsulated soil consisted of moist and loose sand. A sample of the overlying solid material and sample of the underlying encapsulated soil was collected and submitted for laboratory analysis of total solids, TOC, PCBs, PAHs, and metals. The bottom interior of the Lateral was measured to be 6.8 feet below ground surface as measured from the top of the ground surface concrete slab. Upon completion of the Investigation, the excavation was filled with control density fill back to grade.

The sample results for the various collected samples are summarized in Table 1 and visually represented in Figure 2. The video reconnaissance findings are included in Appendix A.

2.3 Investigation Derived Waste

Approximately 35 cubic yards of excavated soils and investigation materials were retained onsite in sealed roll-off bins and characterized for offsite disposal at a permitted facility. The characterization results are contained in Appendix C. The roll-off bins were transported offsite to the Allied Waste/Rabanco Roosevelt Regional Landfill on June 30, 2010.

3 CONCLUSIONS

The conclusions of the Investigation Report are summarized in this section.

3.1 6-inch Lateral Conclusions

No pipes were identified within the approximately 3-foot-wide by 15-foot-long by 4-foot-deep trench that was excavated along the Jorgensen Forge Property fence line in the area purported to contain the 6-inch Lateral at approximately 20 inches below ground surface (see *Phase 2 Transformer PCB Investigation Report* [Floyd | Snider and Weston Solutions 2005]).

These findings indicate that the 6-inch Lateral did not originate from the Jorgensen Forge Property, contrary to the conclusion presented in the *Phase 2 Transformer PCB Investigation Report* (Floyd | Snider and Weston Solutions 2005) and subsequent documents referencing this same conclusion. The 6-inch Lateral likely served a historical Plant 2 structure (for example, the former 2-72 building) and/or a Plant 2 drainage area.

3.2 12-inch Lateral Conclusions

Video reconnaissance indicates that the 12-inch Lateral extends approximately 41 feet south of the dimensional lumber and terminates at a soil and grout plug. Additional excavation was conducted several feet further upgradient beyond the plugged termination point, but no additional piping was identified and native soils were observed to the south. No lateral lines were observed connecting to the 12-inch Lateral and no solid material was identified to be present in the 12-inch Lateral except at the termination point.

The termination point of the 12-inch Lateral was surveyed at an elevation of 13.76 feet MLLW (Appendix B). A review of verified tidal data queried from National Oceanic and Atmospheric Administration (NOAA) station 9447130 through May 21, 2010, shows that the tidal elevation exceeded the measured elevation at the 12-inch Lateral termination point (13.76 feet MLLW) on three occasions in January 2010 and an additional 32 times from 1977 through 2010 (NOAA 2010). This long-term tidal data further indicates that the 12-inch Lateral was affected by recent and historic tidal flushing, consistent with the Farallon findings (2005). Also, the NOAA station tidal elevations do not account for other factors (for example, historical stormwater runoff through the 24-inch Pipe or 12-inch Lateral

coincident with high tide conditions) that may have increased the water surface elevations in the 12-inch Lateral above those reported at the NOAA station. These factors may have caused more than 35 occurrences of tidal heights above the Lateral terminus elevation.

The Investigation included the collection and laboratory analysis of one soil sample collected overlying the 12-inch Lateral, two solids samples collected from within the 12-inch Lateral, and two solids samples of the small amount of gasket material (Table 1). The laboratory analytical results of the soil sample overlying the 12-inch Lateral detected no concentrations of PCBs or PAHs above the laboratory reporting limits (Table 1). The detected concentration of Total PCBs in the solids samples collected from within the 12-inch Lateral ranged from 2 to 8.8 mg/kg (Table 1), which are consistent with the previously detected concentrations of Total PCBs of 6.5 mg/kg (collected by Farallon in 2005) just downgradient from the dimensional lumber within the 12-inch Lateral. The laboratory analytical results detected concentrations of PAHs and metals within the solids samples collected from within the 12-inch Lateral, as summarized in Table 1. The data validation report is included as Appendix D.

The laboratory analytical results of the two solids samples collected from the gasket material within the bell of the 12-inch Lateral were inconsistent and detected concentrations of Total PCBs at 260 mg/kg and 0.29 mg/kg (Table 1). A review of the laboratory documentation did not explain the variability between the reported concentrations.

Concentrations of PAHs were also detected in the solids samples collected from the gasket sealant material (Table 1). The video reconnaissance shows minor penetration of the gasket material through the sampled bell joint, indicating that the bells were likely sealed with a hot process application (Appendix A). Although no information was identified in the Jorgensen Forge files that specifically explained the sealing process for the 12-inch Lateral, hot-sealing joints (commonly referred to as the "Stanford" joint) was typically employed at the time the Lateral was assumed to have been constructed (likely the 1940s and 1950s). The hot-sealing process would have led to cooling, hardening, and curing of the material against the clay side walls of the lateral; this information would explain the immobility of the gasket material since the assumed time of the 12-inch Lateral's installation. It does not indicate a source of PAHs to the 24-inch Pipe.

As shown in Figure 4, the concentrations of Total PCBs detected within the inert gasket material within the 12-inch Lateral (0.29 mg/kg) are significantly lower than the concentrations identified near the connection to the 24-inch Pipe (1,100 mg/kg) and at the nearest downgradient sample within the 24-inch Pipe (10,000 mg/kg). Based on the location of the stub wall and a review of historical aerial photographs, the 12-inch Lateral is located outside of the former Bethlehem Steel Facility buildings. Additionally, the 12-inch Lateral was not shown to extend further south of the termination point. These findings are consistent with a pipe that would have served as a roof drain or catch basin outside of the adjacent buildings.

In summary, this Investigation showed that the 12-inch Lateral:

- Only extends a short distance beyond the previously-identified dimensional lumber before terminating at a grout and soil plug
- Contains no cross-connections and experiences tidal flushing throughout the full length
- Does not extend beyond the encountered termination point
- Only contains trace amounts of immobile gasket material and entrained solids with low level PCB concentrations at elevations that are affected by tidal flushing

These findings indicate that the 12-inch Lateral was not the source of Total PCBs identified within the 24-inch Pipe.

4 REFERENCES

Anchor QEA, LLC, and Floyd | Snider, 2010. 15-inch and 24-inch Property Line Storm Pipes Cleanup Work Plan. Stormwater Source Control Implementation, Lower Duwamish Waterway, Seattle, Washington. Prepared for U.S. Environmental Protection Agency. July 16, 2010.

Farallon Consulting, LLC (Farallon), 2005. "Storm Drain Line Data Summary, Jorgensen Forge Corporation." Technical Memorandum. July 28, 2005.

Farallon and Anchor Environmental, LLC (Anchor), 2004. Second Draft Environmental Sampling Work Plan. Prepared for Jorgensen Forge Corporation. May 12, 2004.

Floyd Snider McCarthy, Inc., 2004. Phase 1 Transformer PCB Investigation Work Plan. Prepared for The Boeing Company. February 24, 2004.

Floyd | Snider and Weston Solutions, Inc., 2005. Phase 2 Transformer PCB Investigation Report. Prepared for The Boeing Company. August 3, 2005.

King County and City of Tukwila, 2008. Letter to Ecology Regarding Notice of Violation No. 6180. December 12, 2008.

NOAA (National Oceanic and Atmospheric Administration), 2010. Historic Tide Height Data from Station ID 9447130. Last accessed at: http://tidesandcurrents.noaa.gov/data_menu.shtml?stn=9447130 Seattle, Puget Sound, Wa, WA&type=Historic+Tide+Data

PTI (PTI Environmental Services), 1988. Sediment Quality Values Refinement: 1988 Update and Evaluation of Puget Sound AET. Prepared for Tetra Tech, Inc. and U.S. Environmental Protection Agency, Region 10, Office of Puget Sound. PTI Environmental Services, Bellevue, WA.

Washington State Department of Ecology (Ecology), 2008. Notice of Violation No. 6180. December 13, 2008.

PHOTOS

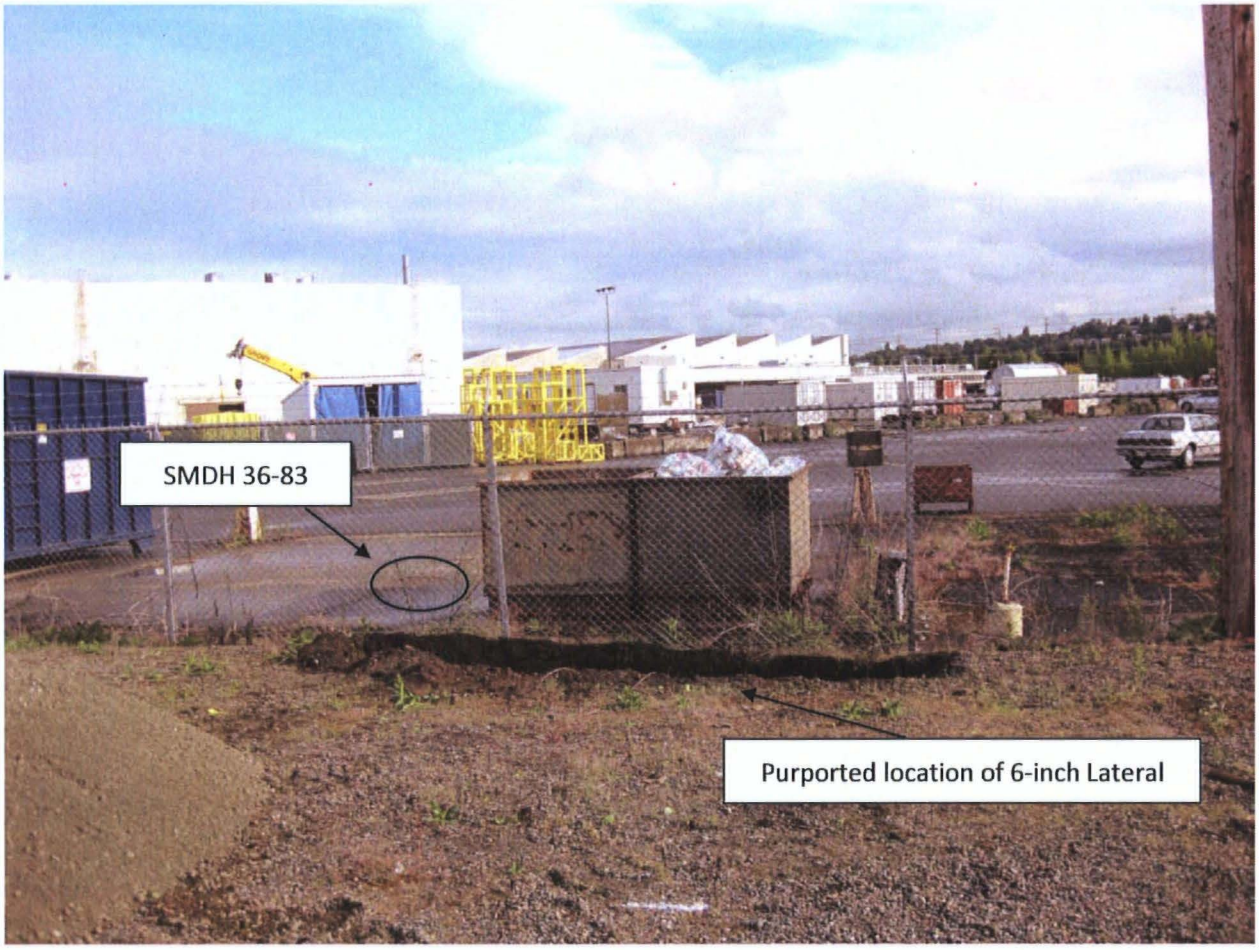


Photo 1 **6-inch Lateral Excavation Facing North toward SDMH 36-83**

Photo 2 **6-inch Lateral Excavation North Wall Showing No Pipe**

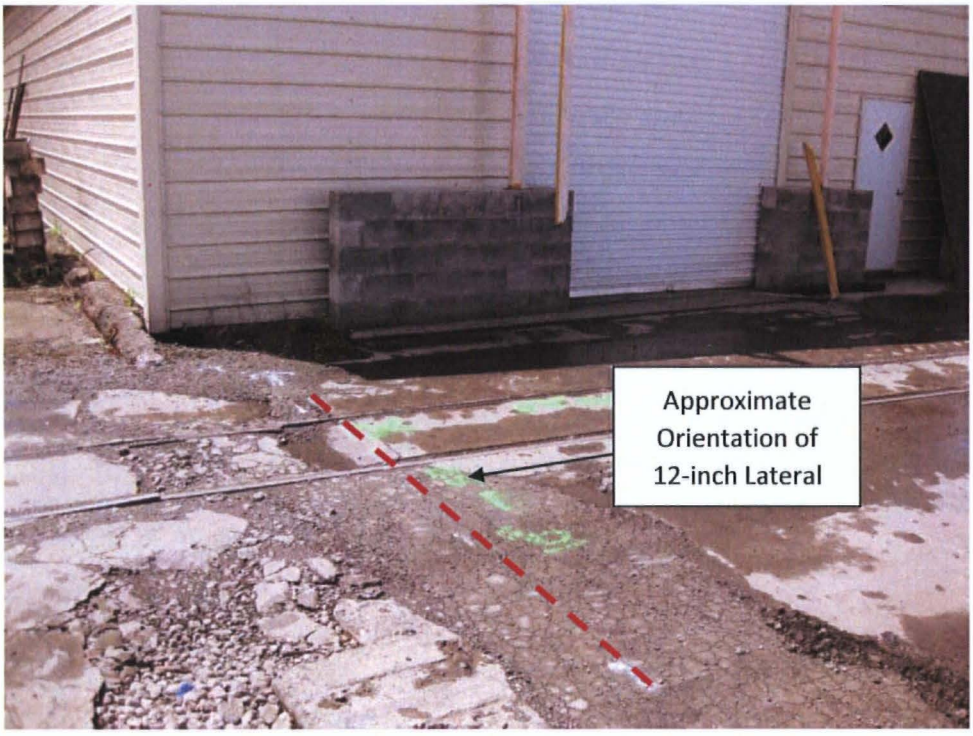


Photo 3 **12-inch Lateral Location Point**

Photo 4 **12-inch Lateral Bell Location (Gasket Sampling Location)**

Photo 5 **12-inch Lateral Termination Point**

Photo 6 **12-inch Lateral Termination Point Grout and Soil Plug**

Photo 7 **12-inch Lateral South Excavation Extent**

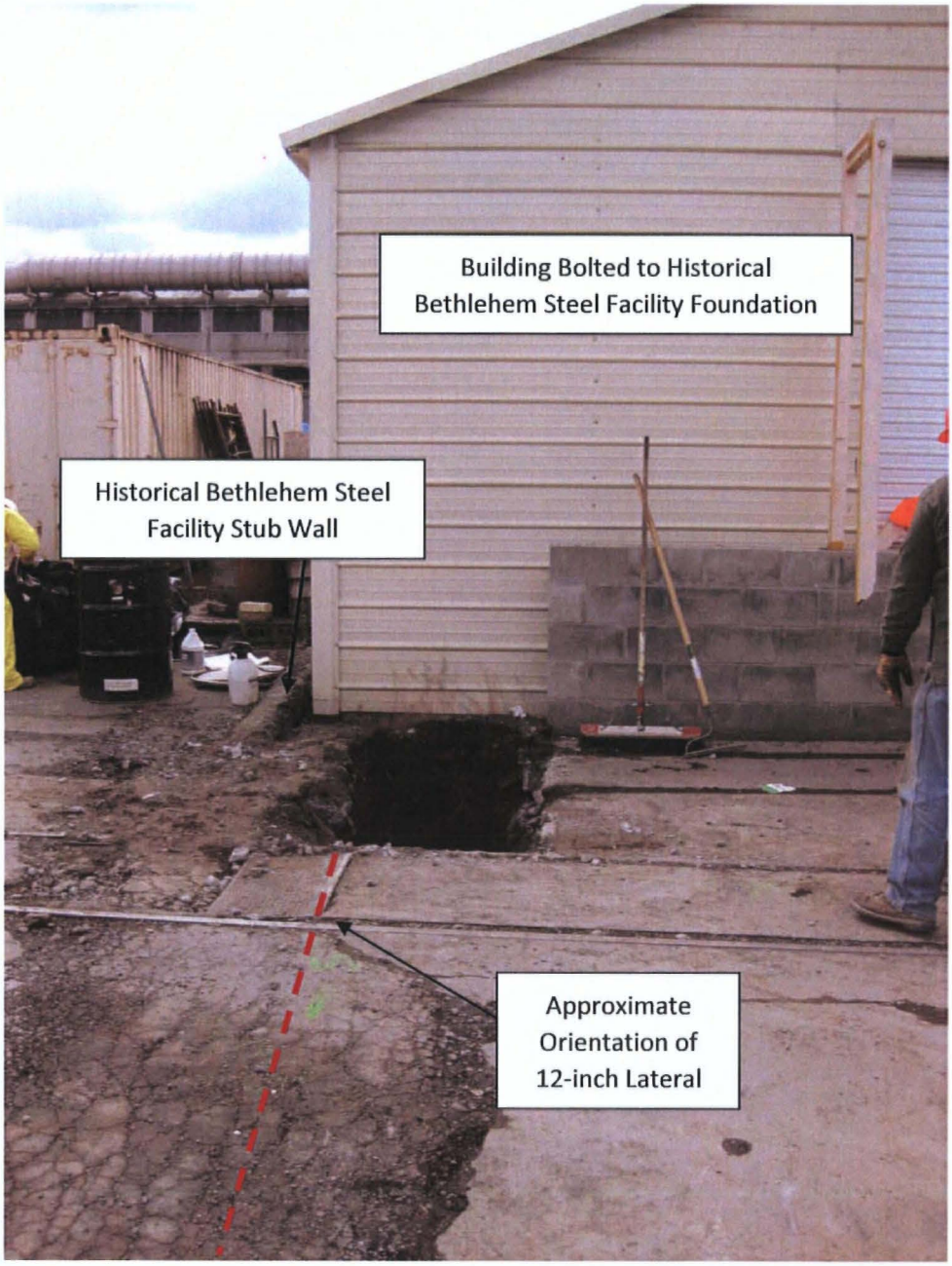


Photo 8 **12-inch Lateral Topside Excavation Extent**

TABLES

Table 1
Summary of Results

Sample	Soil Overlying 12-inch Lateral	Soil collected from within 12-inch Lateral	Overlying Solid Material from within the 12-inch Overlying Soil	Bell Gasket Sample 1	Bell Gasket Sample 2
Sample ID	JFC-12S2-052110	JFC-12S3-052110	JFC-OLMS1-052110	JFC-GASKET S1-052110	JFC-GASKET S2-052110
Sample Date	5/21/2010	5/21/2010	5/21/2010	5/21/2010	5/21/2010
Conventional Parameters (pct)					
Total organic carbon	**0.269**	**4.32**	--	--	--
Total solids	**92.7**	**53.2**	--	--	--
Metals (mg/kg dry)					
Arsenic	5 U	**60**	--	--	--
Barium	**25.4**	**96**	--	--	--
Cadmium	**0.3**	**5**	--	--	--
Chromium	**12.5**	**165**	--	--	--
Lead	**3**	**2810**	--	--	--
Mercury	0.02 U	**32**	--	--	--
Selenium	5 U	40 U	--	--	--
Silver	0.3 U	**6**	--	--	--
Aromatic Hydrocarbons (µg/kg)					
Total 10 of 17 HPAH (U = 0)	4.8 U	**19580**	**5550000**	**523000**	**11100**
Total 17 PAH (U = 0)	4.8 U	**94900**	**16471000**	**1019700**	**161300**
Total 7 of 17 LPAH (U = 0)	4.8 U	**75320**	**10921000**	**496700**	**150200**
1-Methylnaphthalene	4.8 U	**10000**	**1200000**	**57000**	**77000**
2-Methylnaphthalene	4.8 U	**13000**	**1900000**	**80000**	**56000**
Acenaphthene	4.8 U	**2600**	**340000**	**17000**	**64000**
Acenaphthylene	4.8 U	**220**	**41000**	**4700**	4100 U
Anthracene	4.8 U	**1700**	**450000**	**24000**	4100 U
Benzo(a)anthracene	4.8 U	**1700**	**540000**	**36000**	4100 U
Benzo(a)pyrene	4.8 U	**1900**	**610000**	**78000**	4100 U
Benzo(b)fluoranthene	4.8 U	**830**	**240000**	**20000**	4100 U
Benzo(g,h,i)perylene	4.8 U	**950 J**	**280000 J**	**99000 J**	4100 U
Benzo(k)fluoranthene	4.8 U	**830**	**240000**	**20000**	4100 U
Chrysene	4.8 U	**1800**	**550000**	**54000**	**4100**
Dibenzo(a,h)anthracene	4.8 U	**230**	**110000**	**14000**	4100 U
Fluoranthene	4.8 U	**3100**	**790000**	**47000**	4100 U
Fluorene	4.8 U	**3800**	**690000**	**31000**	**8200**

Table 1
Summary of Results

Sample Sample ID Sample Date	Soil Overlying 12-inch Lateral JFC-12S2-052110 5/21/2010	Soil collected from within 12-inch Lateral JFC-12S3-052110 5/21/2010	Overlying Solid Material from within the 12-inch Overlying Soil JFC-OLMS1-052110 5/21/2010	Bell Gasket Sample 1 JFC-GASKET S1-052110 5/21/2010	Bell Gasket Sample 2 JFC-GASKET S2-052110 5/21/2010
Indeno(1,2,3-c,d)pyrene	4.8 U	**640**	**190000**	**25000**	4100 U
Naphthalene	4.8 U	**42000**	**5000000**	**200000**	**7000**
Phenanthrene	4.8 U	**12000**	**2500000**	**140000**	**15000**
Pyrene	4.8 U	**7600**	**2000000**	**130000**	**7000**
Semivolatile Organics (µg/kg)					
Dibenzofuran	4.8 U	**990**	**130000**	**6000**	**46000**
PCB Aroclors (µg/kg)					
Total PCB Aroclors (U = 0)	32 U	**8800**	**2000**	**260000**	**290**
Aroclor 1016	32 U	320 U	61 U	19000 U	61 U
Aroclor 1221	32 U	320 U	61 U	19000 U	61 U
Aroclor 1232	32 U	320 U	61 U	19000 U	61 U
Aroclor 1242	32 U	320 U	61 U	19000 U	61 U
Aroclor 1248	32 U	1600 U	460 U	190000 U	61 U
Aroclor 1254	32 U	**7300**	**2000**	**260000**	**290**
Aroclor 1260	32 U	**1500**	91 U	19000 U	61 U
Aroclor 1262	32 U	320 U	61 U	19000 U	61 U
Aroclor 1268	32 U	320 U	61 U	19000 U	61 U

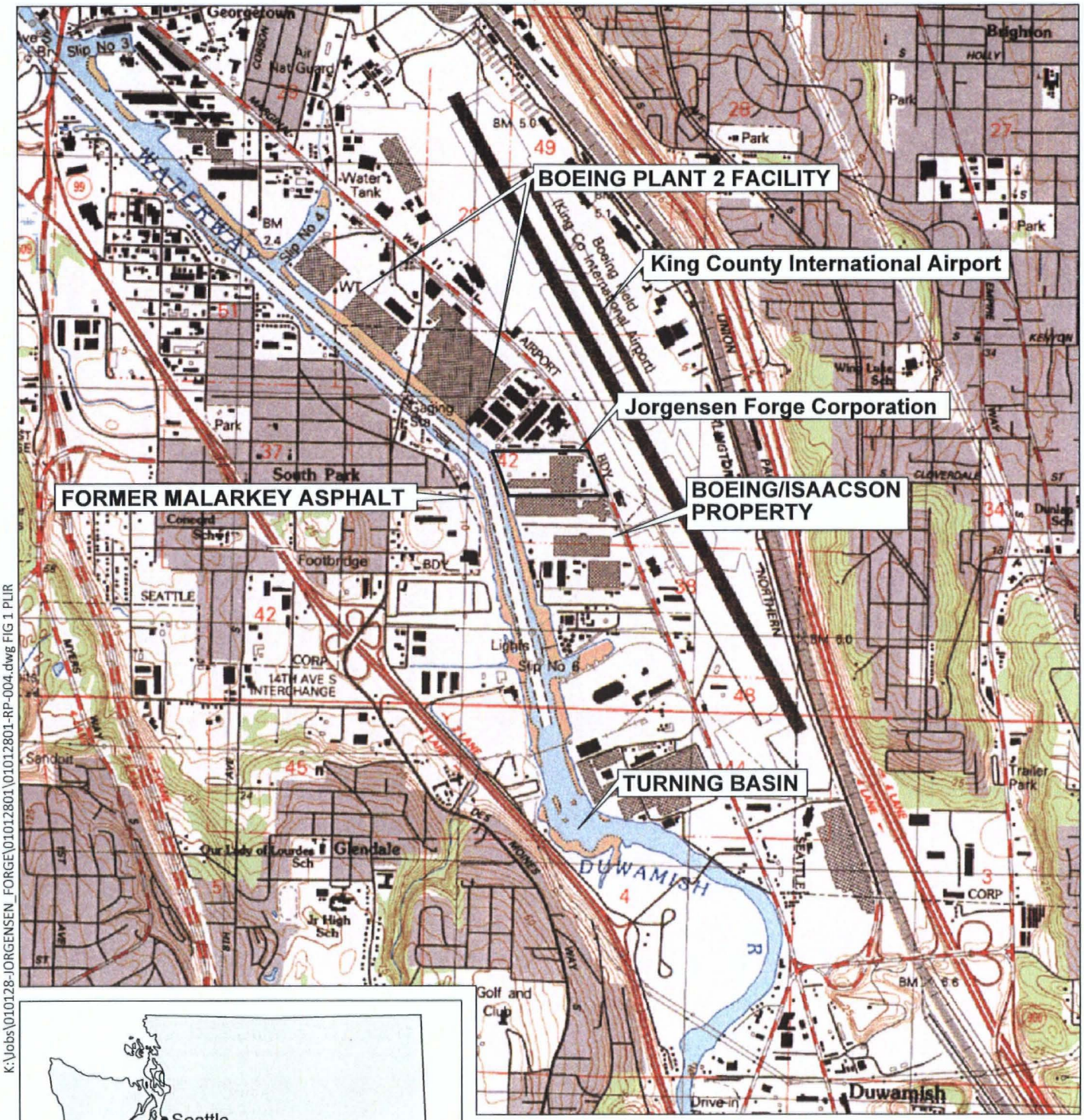
Notes:

µg/kg	micrograms per kilogram	**Bold**	Detected result
mg/kg	miligrams per kilogram	J	Estimated value
pct	percent	U	Compound analyzed, but not detected above detection limit
PCB	polychlorinated biphenyl	--	Not available

Total low polycyclic aromatic hydrocarbons (LPAH) are the total of naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, and 2-methylnapthalene

Total high polycyclic aromatic hydrocarbons (HPAH) are the total of fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene

FIGURES



K:\Jobs\010128-JORGENSEN_FORGE\01012801\01012801-RP-004.dwg FIG 1 PLIR

Dec 01, 2010 2:48pm heriksen

Figure 1

Site Vicinity Map

6-inch and 12-inch Lateral Property Line Pipe Investigation

Jorgensen Forge Corporation

8531 East Marginal Way South, Seattle, Washington

ANCHOR QEA

Boeing Plant 2 Facility

SD005	5/3/05	
AROCLOR	1242	1,400,000U
AROCLOR	1248	1,400,000 U
AROCLOR	1254	**10,000,000**
AROCLOR	1260	1,400,000 U
TOTAL		**10,000,000**

CB010 (COMPOSITE)	4/8/05	CB011 (TOP 9")	4/8/05	CB012 (BOTTOM 3")	4/8/05
AROCLOR 1242	8,000 U	640 U		24,000 U	
AROCLOR 1248	**39,000**	**3,400**		**120,000**	
AROCLOR 1254	**40,000**	**3,000**		**230,000**	
AROCLOR 1260	8,000 U	**800**		47,000 UY	
TOTAL	**79,000**	**7,200**		**350,000**	

12SD-070105-01	7/1/05	
AROCLOR	1016	1,600 U
AROCLOR	1221	1,600 U
AROCLOR	1232	1,600 U
AROCLOR	1242	1,600 U
AROCLOR	1248	1,600 U
AROCLOR	1254	**1,100,000**
AROCLOR	1260	1,600 U
TOTAL		**1,100,000**

SD003	5/3/05	
AROCLOR	1242	16,700 U
AROCLOR	1248	16,700 U
AROCLOR	1254	**140,000**
AROCLOR	1260	16,700 U
TOTAL		**140,000**

SD004	5/3/05	
AROCLOR	1242	323,000 U
AROCLOR	1248	323,000 U
AROCLOR	1254	**2,400,000**
AROCLOR	1260	323,000 U
TOTAL		**2,400,000**

SD002	5/3/05	
AROCLOR	1242	86,200 U
AROCLOR	1248	86,200 U
AROCLOR	1254	**730,000**
AROCLOR	1260	86,200 U
TOTAL		**730,000**

SD001	5/2/05	
AROCLOR	1242	256,000 U
AROCLOR	1248	770,000 U
AROCLOR	1254	**2,600,000**
AROCLOR	1260	256,000 U
TOTAL		**2,600,000**

SD006	6/3/05	
AROCLOR	1242	960 U
AROCLOR	1248	960 U
AROCLOR	1254	**68,000**
AROCLOR	1260	960 U
TOTAL		**68,000**

JFC-12S3-052110	05/21/10	
AROCLOR	1016	< 320 U
AROCLOR	1242	< 320 U
AROCLOR	1248	< 1,600 U
AROCLOR	1254	**7,300**
AROCLOR	1260	**1,500**
AROCLOR	1221	< 320 U
AROCLOR	1232	< 320 U
AROCLOR	1262	< 320 U
AROCLOR	1268	< 320 U
TOTAL		**8,800**

12SD-070105-02	7/1/05	
AROCLOR	1016	1,600 U
AROCLOR	1221	1,600 U
AROCLOR	1232	1,600 U
AROCLOR	1242	1,600 U
AROCLOR	1248	1,600 U
AROCLOR	1254	**6,500**
AROCLOR	1260	1,600 U
TOTAL		**6,500**

Boeing 15-inch Lateral

Boeing 15-inch Property Line Pipe

Boeing 15-inch Lateral

24-inch Property Line Pipe

12-inch Lateral

END OF VIDEO SURVEY, PIPE PLAN

SDMH 15A 9' TO BOTTOM (10.7 FEET MLLW)

FORMER TRANSFORMER SUBSTATION

SDMH 15B 7' 3" TO BOTTOM (12.4 FEET MLLW)

SDMH 24B 10' 6" TO BOTTOM (9.2 FEET MLLW)

NO. 37-7 SDMH-11

NO. 37-2 SDMH 11

SDMH 24A 10' 6" TO BOTTOM (9.2 FEET MLLW)

PLUGGED WITH CEMENT (MAY 2010)

LATERAL TERMINATION (13.76 FEET MLLW)

TO KCIA AND CITY OF TUKWILA DRAINAGE

PUBLIC SDMH 11 9' 6" TO BOTTOM (10.2 FEET MLLW)

Southwest Bank Area

2-66 Area

South Yard Area

JORGENSEN FORGE FACILITY

Paved

BLDG

LEGEND:

- SDMH 24B ● Manhole Location
- 10' 6" TO BOTTOM — Feet to Bottom of Pipe
- (11.2 FEET MLLW) — Assumes Surface Elevation of 19.7 Feet MLLW Across Jorgensen Forge Property
- Property Boundary
- Railroad Spur
- Fence
- Current Facility Structures
- Former Bethlehem Steel Facility Structures (Not to scale)

BOLD Indicates Concentrations Above The Sediment Management Standards Second Lowest Apparent Threshold Screening Level (2LAET; 1,000 mg/kg)

U No Detectable Concentrations Above the Listed Laboratory Reporting Limit

Y Analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit

Note: All results in micrograms per kilogram (ug/kg)

SOURCE: Prepared from drawing provided by Farallon Consulting dated April 15, 2008.

NOTE: Additional buildings added and are not geo-referenced.

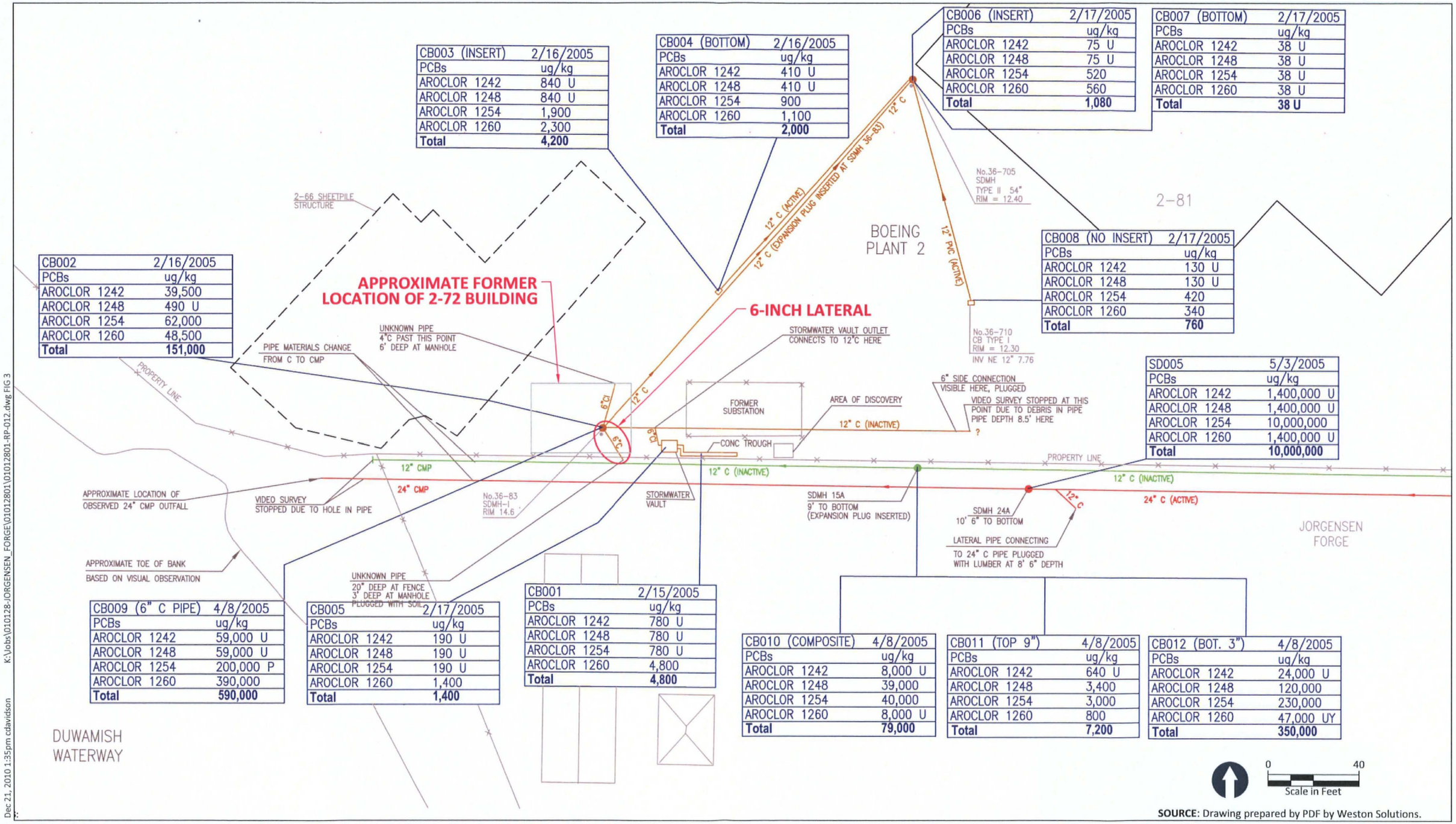
HORIZONTAL DATUM: Washington State Plane North, NAD83.

0 120
Scale in Feet

K:\Jobs\010128-JORGENSEN_FORGE\010128011\012801_RP-010.dwg FIG 2
Dec 16, 2010 3:39pm cdavidson

ANCHOR QEA

Figure 2
Property Line Pipes PCB Analytical Results
6-inch and 12-inch Lateral Property Line Pipe Investigation
Jorgensen Forge Corporation
8531 East Marginal Way South, Seattle, Washington



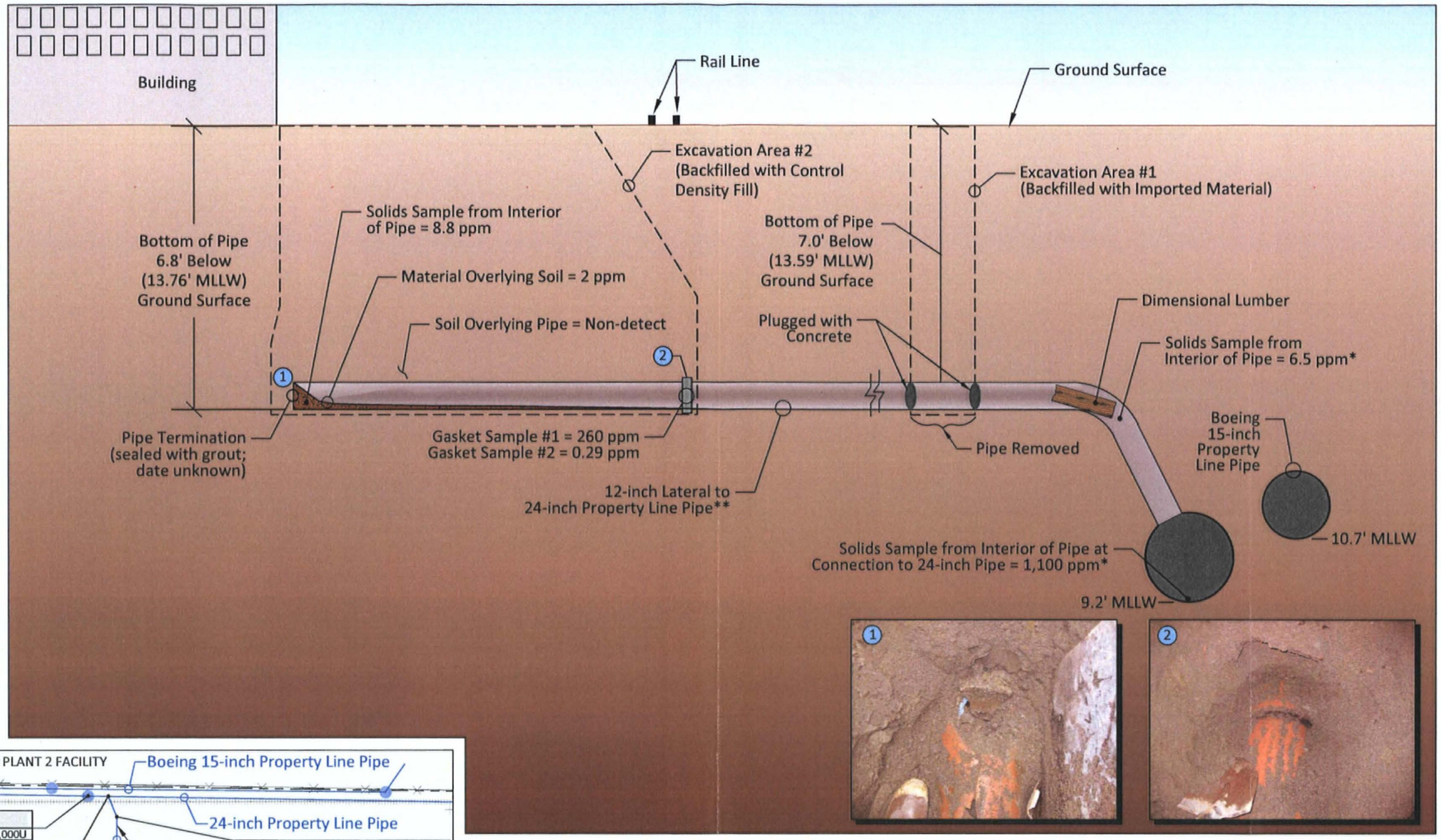
K:\Jobs\010128-JORGENSEN_FORGE\0101280101012801\dwg FIG 3

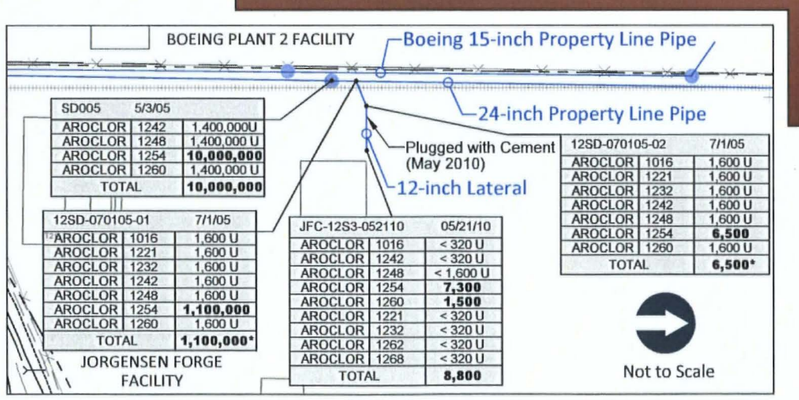
Dec 21, 2010 1:35pm cdavidson

SOURCE: Drawing prepared by PDF by Weston Solutions.

ANCHOR QEA

Figure 3
Boeing Phase 2 Transformer Investigation
6-inch and 12-inch Lateral Property Line Pipe Investigation
Jorgensen Forge Corporation
8531 East Marginal Way South, Seattle, Washington





SD005	5/3/05	
AROCLOR	1242	1,400,000U
AROCLOR	1248	1,400,000 U
AROCLOR	1254	**10,000,000**
AROCLOR	1260	1,400,000 U
TOTAL		**10,000,000**

12SD-070105-01	7/1/05	
AROCLOR	1016	1,600 U
AROCLOR	1221	1,600 U
AROCLOR	1232	1,600 U
AROCLOR	1242	1,600 U
AROCLOR	1248	1,600 U
AROCLOR	1254	**1,100,000**
AROCLOR	1260	1,600 U
TOTAL		**1,100,000***

JFC-12S3-052110	05/21/10	
AROCLOR	1016	< 320 U
AROCLOR	1242	< 320 U
AROCLOR	1248	< 1,600 U
AROCLOR	1254	**7,300**
AROCLOR	1260	**1,500**
AROCLOR	1221	< 320 U
AROCLOR	1232	< 320 U
AROCLOR	1262	< 320 U
AROCLOR	1268	< 320 U
TOTAL		**8,800**

12SD-070105-02	7/1/05	
AROCLOR	1016	1,600 U
AROCLOR	1221	1,600 U
AROCLOR	1232	1,600 U
AROCLOR	1242	1,600 U
AROCLOR	1248	1,600 U
AROCLOR	1254	**6,500**
AROCLOR	1260	1,600 U
TOTAL		**6,500***

Plan View
Not to Scale

Not to Scale

NOTES:

*Farallon Consulting, LLC (Farallon), 2005. Storm Drain Line Data Summary, Jorgensen Forge Corporation Technical Memorandum, July 28, 2005.

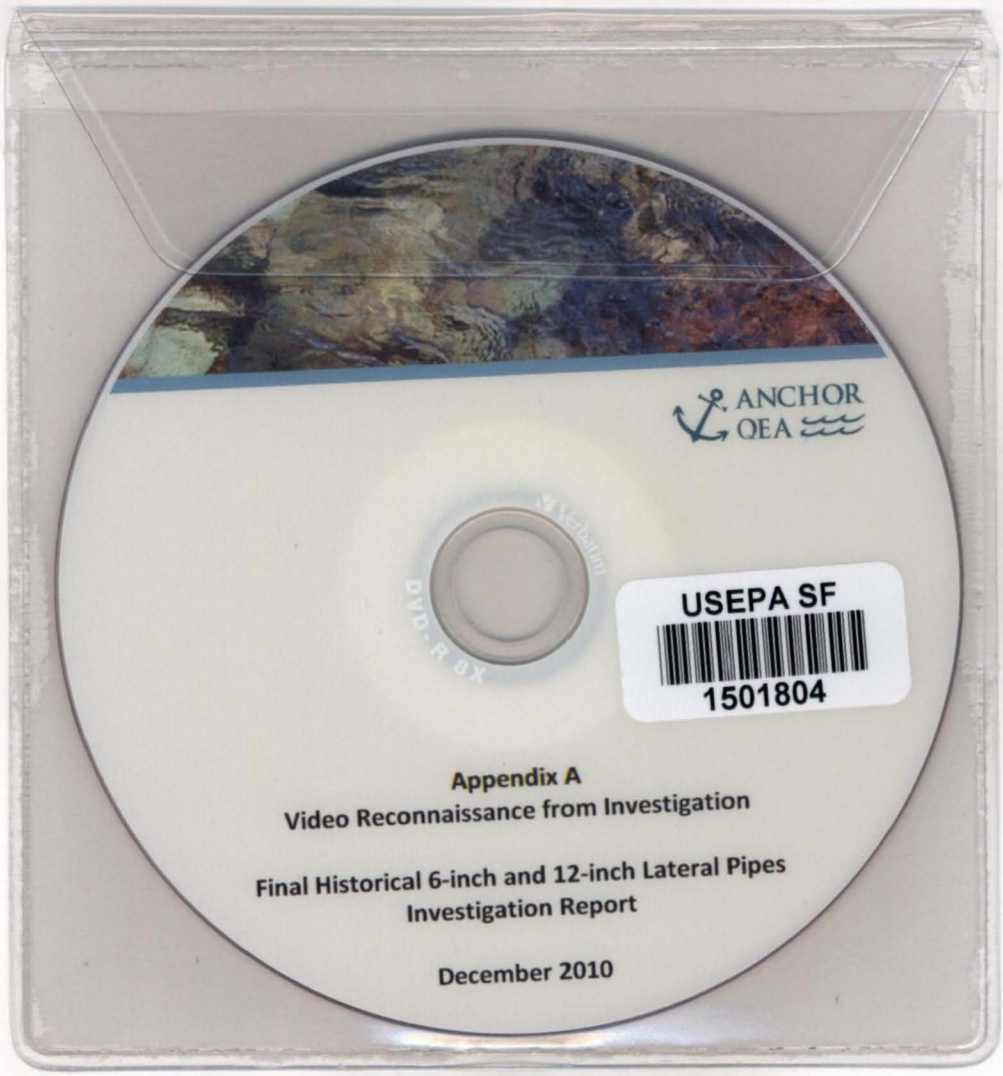
**The 12-inch lateral was discovered to be a 10-inch clay pipe rather than the previously reported 12-inch concrete pipe. This Investigation Report refers to this pipe as the 12-lateral for consistency.

VERTICAL DATUM: Mean Lower Low Water (MLLW)

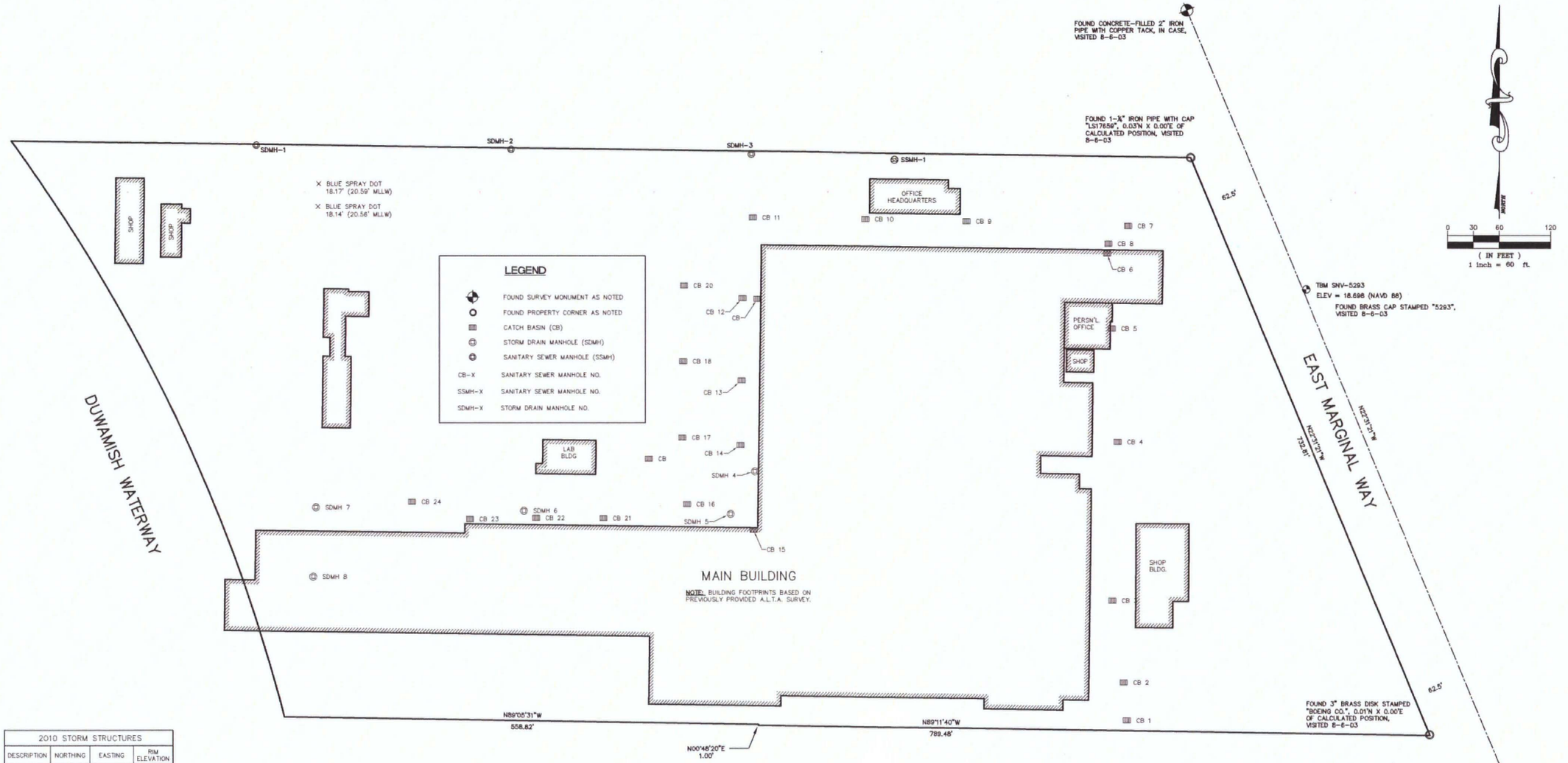
ANCHOR QEA

Figure 4
Total PCB Concentrations - 12-inch Lateral Investigation
6-inch and 12-inch Lateral Property Line Pipe Investigation
Jorgensen Forge Corporation
8531 East Marginal Way South, Seattle, Washington

APPENDIX A
VIDEO RECONNAISSANCE FROM INVESTIGATION (ON DVD)



APPENDIX B
SURVEY FIGURE FROM PLS, INC.



2010 STORM STRUCTURES			
DESCRIPTION	NORTHING	EASTING	RIM ELEVATION
CB	195622.93	1276645.22	17.77
CB	195435.38	1276517.07	17.50
CB 1	195128.83	1277080.76	16.93
CB 2	195173.38	1277077.10	17.42
CB 3	195269.46	1277063.66	17.07
CB 4	195455.67	1277069.87	17.45
CB 5	195588.66	1277062.80	17.51
CB 6	195676.56	1277057.36	18.09
CB 7	195708.70	1277081.88	17.74
CB 8	195687.92	1277058.74	18.18
CB 9	195714.02	1276892.02	18.05
CB 10	195716.51	1276773.54	18.14
CB 11	195718.34	1276639.84	17.82
CB 12	195623.85	1276627.78	18.92
CB 13	195527.19	1276626.69	17.45
CB 14	195451.49	1276625.32	17.52
CB 15	195352.08	1276640.65	17.58
CB 16	195382.16	1276562.07	17.27
CB 17	195460.28	1276556.76	17.33
CB 18	195549.83	1276557.70	17.41
CB 20	195638.71	1276558.75	17.21
CB 21	195365.78	1276463.42	17.20
CB 22	195366.14	1276383.57	17.37
CB 23	195364.79	1276305.46	17.48
CB 24	195385.07	1276237.16	17.56
SDMH 4	195420.67	1276642.23	18.12
SDMH 5	195370.71	1276613.62	17.50
SDMH 6	195374.61	1276369.29	17.81
SDMH 7	195378.65	1276124.45	17.52
SDMH 8	195297.35	1276121.12	18.06

2003 STORM & SANITARY SEWER STRUCTURES

	NAD 83 (91)		NAVD 88
NOMENCLATURE-DESCRIPTION	NORTHING	EASTING	RIM ELEV
SSMH-1	195786.16	1276807.68	17.65
SDMH-1	195802.99	1276055.26	17.10
SDMH-2	195798.21	1276354.29	17.09
SDMH-3	195792.30	1276638.25	17.28

NOMENCLATURE-DESCRIPTION	INVERT ELEV	DIRECTION	PIPE SIZE	COMMENT
SSMH-1	7.15	EAST	24"	
"	7.10	WEST	24"	
SDMH-1	8.7	EAST	18"?	DEBRIS
"	8.6	WEST	18"?	DEBRIS
SDMH-2	9.8	NORTHEAST	12"?	DEBRIS
"	9.8	WEST	18"?	DEBRIS
SDMH-3	7.48	NORTHEAST	12"	
"	6.98	SOUTH	18"	

DEBRIS- PIPES FULL OF DEBRIS, INVERT ELEV TO TOP OF DEBRIS
? - PIPE SIZE UNCERTAIN DUE TO EXTENT OF DEBRIS

SURVEYOR'S NOTES AND COMMENTS:

1. BASIS OF BEARINGS: WASHINGTON COORDINATE SYSTEM, NORTH ZONE NAD 83(91), PER RECORD OF SURVEY RECORDING NUMBER 9601039012.

2. VERTICAL DATUM: NAVD 88 PER CITY OF SEATTLE BENCHMARK NO. SNV-5293. ELEVATION = 18.698. TO CONVERT ANY NAVD 88 ELEVATION TO MEAN LOWER LOW WATER (MLLW) ADD 2.42 FEET.

3. BOUNDARY: THE BOUNDARY SHOWN HEREON IS BASED UPON RECORD OF SURVEY RECORDING NUMBER 9004309031. A LIMITED FIELD SURVEY WAS PERFORMED TO VERIFY THE EASTERLY LINE OF SAID SURVEY. DISCREPANCIES HAVE BEEN NOTED HEREON.

4. FIELD SURVEY METHODOLOGY: FIELD MEASUREMENTS FOR THIS SURVEY WERE PERFORMED USING A NIKON DTM-530, 3-SECOND ELECTRONIC TOTAL STATION IN CONFORMANCE WITH ACCEPTED SURVEY PROCEDURES WHICH MEET OR EXCEED STATE STANDARDS AS SPECIFIED BY WAC - 332-130 WITH REGARD TO LINEAR AND ANGULAR CLOSURES.

5. INSTRUMENT CALIBRATION: ALL MEASURING INSTRUMENTS EMPLOYED IN THIS SURVEY HAVE BEEN MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

6. PURPOSE OF SURVEY: THE PURPOSE OF THIS SURVEY WAS TO DETERMINE VIA FIELD SURVEY THE COORDINATE LOCATION AND RIM ELEVATION OF CLIENT-SELECTED STORM DRAINAGE STRUCTURES AND TO GRAPHICALLY PORTRAY THE FIELD SURVEY RESULTS ON THIS MAP. NO DETAILING (SIZE, MATERIAL AND INVERT ELEVATION) OF FLOW LINES WITHIN THOSE STRUCTURES WAS CONDUCTED OR REQUESTED.

7. EXCLUSIVITY: THIS SURVEY WAS PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT NAMED HEREON. ITS' USE DOES NOT EXTEND TO ANY UNNAMED PERSON OR PERSONS WITHOUT THE EXPRESS RECERTIFICATION BY THIS SURVEYOR NAMING SUCH PARTY.

PLS, Inc.
Professional Land Surveyors
355 NW Gilman Blvd., Suite 201
Issaquah, Washington 98027
(425) 313-9378 (fax) 313-9378

JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY
SEATTLE, WA

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	8/25/10	ADDED NAVD 88 AND MLLW ELEVATIONS TO (2) BLUE SPRAY DOTS, AND REVISED SURVEYOR'S NOTE (2).	BPM

SHEET TITLE: JORGENSEN FORGE FACILITY EXHIBIT MAP

CLIENT: ANCHOR QEA
1423 3RD AVE, SUITE 300
SEATTLE, WA 98101

DRAWN BY: BPM
CHECKED BY: BVP
SCALE: 1" = 60'
DATE: AUG. 23, 2010
JOB NO: 10-046
DRAWING NAME: 10-046 TOPO.DWG

SHEET 1 OF 1

APPENDIX C
WASTE CHARACTERIZATION REPORTS

SAMPLE RESULTS-CONVENTIONALS
QX51-Anchor Environmental

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 05/25/10

Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: 05/21/10
Date Received: 05/21/10

Client ID: JFC-12S2-052110
ARI ID: 10-12279 QX51A

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/21/10 052110#1	EPA 160.3	Percent	0.01	92.70
Total Organic Carbon	05/24/10 052410#1	Plumb,1981	Percent	0.020	0.269

RL Analytical reporting limit
U Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: JFC-12S2-052110
SAMPLE

Lab Sample ID: QX51A
LIMS ID: 10-12279
Matrix: Soil
Data Release Authorized:
Reported: 05/24/10

QC Report No: QX51-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/21/10
Date Received: 05/21/10

Date Extracted: 05/21/10
Date Analyzed: 05/22/10 18:56
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.6 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: Yes

Percent Moisture: 7.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	32	< 32 U
53469-21-9	Aroclor 1242	32	< 32 U
12672-29-6	Aroclor 1248	32	< 32 U
11097-69-1	Aroclor 1254	32	< 32 U
11096-82-5	Aroclor 1260	32	< 32 U
11104-28-2	Aroclor 1221	32	< 32 U
11141-16-5	Aroclor 1232	32	< 32 U
37324-23-5	Aroclor 1262	32	< 32 U
11100-14-4	Aroclor 1268	32	< 32 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	96.6%
Tetrachlorometaxylene	74.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: JFC-12S2-052110
SAMPLE

Lab Sample ID: QX51A
LIMS ID: 10-12279
Matrix: Soil
Data Release Authorized:
Reported: 05/24/10

QC Report No: QX51-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: 05/21/10
Date Received: 05/21/10

Date Extracted: 05/21/10
Date Analyzed: 05/22/10 17:22
Instrument/Analyst: NT8/YZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 7.1%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.8	< 4.8 U
91-57-6	2-Methylnaphthalene	4.8	< 4.8 U
90-12-0	1-Methylnaphthalene	4.8	< 4.8 U
208-96-8	Acenaphthylene	4.8	< 4.8 U
83-32-9	Acenaphthene	4.8	< 4.8 U
86-73-7	Fluorene	4.8	< 4.8 U
85-01-8	Phenanthrene	4.8	< 4.8 U
120-12-7	Anthracene	4.8	< 4.8 U
206-44-0	Fluoranthene	4.8	< 4.8 U
129-00-0	Pyrene	4.8	< 4.8 U
56-55-3	Benzo(a)anthracene	4.8	< 4.8 U
218-01-9	Chrysene	4.8	< 4.8 U
205-99-2	Benzo(b)fluoranthene	4.8	< 4.8 U
207-08-9	Benzo(k)fluoranthene	4.8	< 4.8 U
50-32-8	Benzo(a)pyrene	4.8	< 4.8 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	< 4.8 U
53-70-3	Dibenz(a,h)anthracene	4.8	< 4.8 U
191-24-2	Benzo(g,h,i)perylene	4.8	< 4.8 U
132-64-9	Dibenzofuran	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.3%
d14-Dibenzo(a,h)anthracen	84.0%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: JFC-12S2-052110
SAMPLE

Lab Sample ID: QX51A
LIMS ID: 10-12279
Matrix: Soil
Data Release Authorized:
Reported: 05/26/10

QC Report No: QX51-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/21/10
Date Received: 05/21/10

Percent Total Solids: 92.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	05/21/10	6010B	05/25/10	7440-38-2	Arsenic	5	5	U
3050B	05/21/10	6010B	05/25/10	**7440-39-3**	**Barium**	0.3	**25.4**	
3050B	05/21/10	6010B	05/25/10	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	05/21/10	6010B	05/25/10	**7440-47-3**	**Chromium**	0.5	**12.5**	
3050B	05/21/10	6010B	05/25/10	**7439-92-1**	**Lead**	2	**3**	
CLP	05/21/10	7471A	05/24/10	7439-97-6	Mercury	0.02	0.02	U
3050B	05/21/10	6010B	05/25/10	7782-49-2	Selenium	5	5	U
3050B	05/21/10	6010B	05/25/10	7440-22-4	Silver	0.3	0.3	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
SAMPLE

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Percent Total Solids: 91.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	05/27/10	6010B	05/28/10	**7440-38-2**	**Arsenic**	10	**10**	
3050B	05/27/10	6010B	05/28/10	**7440-39-3**	**Barium**	0.8	**76.1**	
3050B	05/27/10	6010B	05/28/10	**7440-43-9**	**Cadmium**	0.5	**0.8**	
3050B	05/27/10	6010B	05/28/10	**7440-47-3**	**Chromium**	1	**1,210**	
3050B	05/27/10	6010B	05/28/10	**7439-92-1**	**Lead**	5	**184**	
CLP	05/27/10	7471A	05/28/10	**7439-97-6**	**Mercury**	0.02	**0.12**	
3050B	05/27/10	6010B	05/28/10	7782-49-2	Selenium	10	10	U
3050B	05/27/10	6010B	05/28/10	7440-22-4	Silver	0.8	0.8	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
DUPLICATE

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	10	10 U	0.0%	+/- 10	L
Barium	6010B	76.1	91.1	17.9%	+/- 20%	
Cadmium	6010B	0.8	2.0	85.7%	+/- 0.5	L*
Chromium	6010B	1,210	2,560	71.6%	+/- 20%	*
Lead	6010B	184	153	18.4%	+/- 20%	
Mercury	7471A	0.12	0.03	120%	+/- 0.02	L*
Selenium	6010B	10 U	10 U	0.0%	+/- 10	L
Silver	6010B	0.8 U	0.8 U	0.0%	+/- 0.8	L

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
MATRIX SPIKE

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010B	10	200	205	92.7%	
Barium	6010B	76.1	265	205	92.1%	
Cadmium	6010B	0.8	52.0	51.3	99.8%	
Chromium	6010B	1,210	1,180	51.3	-58.5%	H
Lead	6010B	184	392	205	101%	
Mercury	7471A	0.12	0.24	0.197	60.9%	N
Selenium	6010B	10 U	190	205	92.7%	
Silver	6010B	0.8 U	46.3	51.3	90.3%	

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: JFC-Bin2Comp1-052610
SAMPLE

Lab Sample ID: QY16B
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Percent Total Solids: 88.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	05/27/10	6010B	05/28/10	**7440-38-2**	**Arsenic**	5	7	
3050B	05/27/10	6010B	05/28/10	**7440-39-3**	**Barium**	0.3	123	
3050B	05/27/10	6010B	05/28/10	**7440-43-9**	**Cadmium**	0.2	4.2	
3050B	05/27/10	6010B	05/28/10	**7440-47-3**	**Chromium**	0.5	96.5	
3050B	05/27/10	6010B	05/28/10	**7439-92-1**	**Lead**	2	123	
CLP	05/27/10	7471A	05/28/10	**7439-97-6**	**Mercury**	0.02	0.05	
3050B	05/27/10	6010B	05/28/10	7782-49-2	Selenium	5	5	U
3050B	05/27/10	6010B	05/28/10	**7440-22-4**	**Silver**	0.3	0.8	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QY16LCS
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	194	200	97.0%	
Barium	6010B	193	200	96.5%	
Cadmium	6010B	49.0	50.0	98.0%	
Chromium	6010B	49.8	50.0	99.6%	
Lead	6010B	188	200	94.0%	
Mercury	7471A	0.52	0.50	104%	
Selenium	6010B	193	200	96.5%	
Silver	6010B	48.6	50.0	97.2%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QY16MB
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/01/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	05/27/10	6010B	05/28/10	7440-38-2	Arsenic	5	5	U
3050B	05/27/10	6010B	05/28/10	7440-39-3	Barium	0.3	0.3	U
3050B	05/27/10	6010B	05/28/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	05/27/10	6010B	05/28/10	7440-47-3	Chromium	0.5	0.5	U
3050B	05/27/10	6010B	05/28/10	7439-92-1	Lead	2	2	U
CLP	05/27/10	7471A	05/28/10	7439-97-6	Mercury	0.02	0.02	U
3050B	05/27/10	6010B	05/28/10	7782-49-2	Selenium	5	5	U
3050B	05/27/10	6010B	05/28/10	7440-22-4	Silver	0.3	0.3	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-052810	72.2%	30-160	69.0%	30-160	0
LCS-052810	76.0%	30-160	72.0%	30-160	0
JFC-Bin1Comp1-052610	114%	30-160	79.0%	30-160	0
JFC-Bin2Comp1-052610	NR	30-160	96.2%	30-160	0

Microwave (MARS) Control Limits
Prep Method: SW3546
Log Number Range: 10-12626 to 10-12627

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
SAMPLE

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 05/28/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Date Extracted: 05/28/10
Date Analyzed: 05/28/10 12:34
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: No

Percent Moisture: 10.0%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	31	< 31 U
53469-21-9	Aroclor 1242	31	< 31 U
12672-29-6	Aroclor 1248	160	< 160 Y
11097-69-1	**Aroclor 1254**	**31**	**670**
11096-82-5	Aroclor 1260	31	< 31 U
11104-28-2	Aroclor 1221	31	< 31 U
11141-16-5	Aroclor 1232	31	< 31 U
37324-23-5	Aroclor 1262	460	< 460 Y
11100-14-4	**Aroclor 1268**	**31**	**300**

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	114%
Tetrachlorometaxylene	79.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: JFC-Bin2Comp1-052610
SAMPLE

Lab Sample ID: QY16B
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 05/28/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Date Extracted: 05/28/10
Date Analyzed: 05/28/10 13:49
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 25.0
Silica Gel: No

Percent Moisture: 12.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	180	< 180 U
53469-21-9	Aroclor 1242	180	< 180 U
12672-29-6	Aroclor 1248	180	< 180 U
11097-69-1	Aroclor 1254	280	< 280 Y
11096-82-5	Aroclor 1260	180	< 180 U
11104-28-2	Aroclor 1221	180	< 180 U
11141-16-5	Aroclor 1232	180	< 180 U
37324-23-5	**Aroclor 1262**	**180**	**2,500**
11100-14-4	Aroclor 1268	920	< 920 Y

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	96.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-052810
METHOD BLANK

Lab Sample ID: MB-052810
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 05/28/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 05/28/10
Date Analyzed: 05/28/10 13:30
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.0 g
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	6.7	< 6.7 U
53469-21-9	Aroclor 1242	6.7	< 6.7 U
12672-29-6	Aroclor 1248	6.7	< 6.7 U
11097-69-1	Aroclor 1254	6.7	< 6.7 U
11096-82-5	Aroclor 1260	6.7	< 6.7 U
11104-28-2	Aroclor 1221	6.7	< 6.7 U
11141-16-5	Aroclor 1232	6.7	< 6.7 U
37324-23-5	Aroclor 1262	6.7	< 6.7 U
11100-14-4	Aroclor 1268	6.7	< 6.7 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	72.2%
Tetrachlorometaxylene	69.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-052810
LAB CONTROL

Lab Sample ID: LCS-052810
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 05/28/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 05/28/10
Date Analyzed: 05/28/10 14:08
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.0 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	130	167	77.8%
Aroclor 1260	115	167	68.9%

PCB Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	72.0%

Results reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
SAMPLE

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 06/02/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Date Extracted: 06/01/10
Date Analyzed: 06/01/10 13:28
Instrument/Analyst: NT8/PK
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.9 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 2.00
Percent Moisture: 10.0%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	9.2	49
91-57-6	2-Methylnaphthalene	9.2	54
90-12-0	1-Methylnaphthalene	9.2	56
208-96-8	Acenaphthylene	9.2	110
83-32-9	Acenaphthene	9.2	30
86-73-7	Fluorene	9.2	180
85-01-8	Phenanthrene	9.2	1,900 E
120-12-7	Anthracene	9.2	640
206-44-0	Fluoranthene	9.2	2,100 E
129-00-0	Pyrene	9.2	2,300 E
56-55-3	Benzo(a)anthracene	9.2	1,600 E
218-01-9	Chrysene	9.2	4,400 E
205-99-2	Benzo(b)fluoranthene	9.2	2,100 E
207-08-9	Benzo(k)fluoranthene	9.2	2,000 E
50-32-8	Benzo(a)pyrene	9.2	2,100 E
193-39-5	Indeno(1,2,3-cd)pyrene	9.2	1,000 E
53-70-3	Dibenz(a,h)anthracene	9.2	500
191-24-2	Benzo(g,h,i)perylene	9.2	1,100 E
132-64-9	Dibenzofuran	9.2	54

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	74.7%
d14-Dibenzo(a,h)anthracen	68.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
DILUTION

Lab Sample ID: QY16A
LIMS ID: 10-12626
Matrix: Soil
Data Release Authorized:
Reported: 06/02/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Date Extracted: 06/01/10
Date Analyzed: 06/01/10 15:16
Instrument/Analyst: NT8/PK
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.9 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 20.0
Percent Moisture: 10.0%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	92	< 92 U
91-57-6	2-Methylnaphthalene	92	< 92 U
90-12-0	1-Methylnaphthalene	92	< 92 U
208-96-8	**Acenaphthylene**	**92**	**120**
83-32-9	Acenaphthene	92	< 92 U
86-73-7	**Fluorene**	**92**	**190**
85-01-8	**Phenanthrene**	**92**	**1,600**
120-12-7	**Anthracene**	**92**	**600**
206-44-0	**Fluoranthene**	**92**	**1,500**
129-00-0	**Pyrene**	**92**	**2,300**
56-55-3	**Benzo(a)anthracene**	**92**	**1,400**
218-01-9	**Chrysene**	**92**	**3,300**
205-99-2	**Benzo(b)fluoranthene**	**92**	**1,700**
207-08-9	**Benzo(k)fluoranthene**	**92**	**1,700**
50-32-8	**Benzo(a)pyrene**	**92**	**1,900**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**92**	**1,100**
53-70-3	**Dibenz(a,h)anthracene**	**92**	**550**
191-24-2	**Benzo(g,h,i)perylene**	**92**	**1,200**
132-64-9	Dibenzofuran	92	< 92 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	80.0%
d14-Dibenzo(a,h)anthracen	120%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: JFC-Bin2Comp1-052610
SAMPLE

Lab Sample ID: QY16B
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/02/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Date Extracted: 06/01/10
Date Analyzed: 06/01/10 13:49
Instrument/Analyst: NT8/PK
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 12.2%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	4.7	33
91-57-6	**2-Methylnaphthalene**	4.7	41
90-12-0	**1-Methylnaphthalene**	4.7	24
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	**Acenaphthene**	4.7	11
86-73-7	**Fluorene**	4.7	12
85-01-8	**Phenanthrene**	4.7	38
120-12-7	**Anthracene**	4.7	12
206-44-0	**Fluoranthene**	4.7	16
129-00-0	**Pyrene**	4.7	23
56-55-3	**Benzo(a)anthracene**	4.7	8.9
218-01-9	**Chrysene**	4.7	16
205-99-2	**Benzo(b)fluoranthene**	4.7	9.4
207-08-9	**Benzo(k)fluoranthene**	4.7	9.4
50-32-8	**Benzo(a)pyrene**	4.7	8.4
193-39-5	**Indeno(1,2,3-cd)pyrene**	4.7	7.5
53-70-3	Dibenz(a,h)anthracene	4.7	< 4.7 U
191-24-2	**Benzo(g,h,i)perylene**	4.7	11
132-64-9	**Dibenzofuran**	4.7	13

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.7%
d14-Dibenzo(a,h)anthracen	75.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: MB-060110
METHOD BLANK

Lab Sample ID: MB-060110
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/02/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 06/01/10
Date Analyzed: 06/01/10 12:46
Instrument/Analyst: NT8/PK
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	5.0	< 5.0 U
208-96-8	Acenaphthylene	5.0	< 5.0 U
83-32-9	Acenaphthene	5.0	< 5.0 U
86-73-7	Fluorene	5.0	< 5.0 U
85-01-8	Phenanthrene	5.0	< 5.0 U
120-12-7	Anthracene	5.0	< 5.0 U
206-44-0	Fluoranthene	5.0	< 5.0 U
129-00-0	Pyrene	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	5.0	< 5.0 U
218-01-9	Chrysene	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0	< 5.0 U
132-64-9	Dibenzofuran	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	76.7%
d14-Dibenzo(a,h)anthracen	85.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-060110
LAB CONTROL SAMPLE

Lab Sample ID: LCS-060110
LIMS ID: 10-12627
Matrix: Soil
Data Release Authorized:
Reported: 06/02/10

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
Event: 010128-01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 06/01/10
Date Analyzed LCS: 06/01/10 13:07
Instrument/Analyst LCS: NT8/PK

Sample Amount LCS: 10.0 g-dry-wt
Final Extract Volume LCS: 0.50 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	97.5	150	65.0%
2-Methylnaphthalene	106	150	70.7%
1-Methylnaphthalene	108	150	72.0%
Acenaphthylene	101	150	67.3%
Acenaphthene	102	150	68.0%
Fluorene	106	150	70.7%
Phenanthrene	111	150	74.0%
Anthracene	113	150	75.3%
Fluoranthene	123	150	82.0%
Pyrene	134	150	89.3%
Benzo(a)anthracene	130	150	86.7%
Chrysene	126	150	84.0%
Benzo(b)fluoranthene	146	150	97.3%
Benzo(k)fluoranthene	110	150	73.3%
Benzo(a)pyrene	124	150	82.7%
Indeno(1,2,3-cd)pyrene	123	150	82.0%
Dibenz(a,h)anthracene	130	150	86.7%
Benzo(g,h,i)perylene	120	150	80.0%
Dibenzofuran	97.5	150	65.0%

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	73.0%
d14-Dibenzo(a,h)anthracen	85.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: QY16-Anchor Environmental
Project: Jorgensen Forge
010128-01.01

Client ID	MNP	DBA	TOT OUT
JFC-Bin1Comp1-052610	74.7%	68.0%	0
JFC-Bin1Comp1-052610 DL	80.0%	120%*	1
MB-060110	76.7%	85.7%	0
LCS-060110	73.0%	85.3%	0
JFC-Bin2Comp1-052610	70.7%	75.3%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(35-100)	(34-100)
(DBA) = d14-Dibenzo(a,h)anthracene	(37-120)	(10-117)

Prep Method: SW3546
Log Number Range: 10-12626 to 10-12627

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
SAMPLE

Lab Sample ID: RA88A
LIMS ID: 10-14537
Matrix: Soil
Data Release Authorized:
Reported: 06/23/10

QC Report No: RA88-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	06/17/10	6010B	06/21/10	7440-47-3	Chromium	0.02	0.02	U
1311	06/17/10	6010B	06/21/10	**7439-92-1**	**Lead**	0.1	**0.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610 DUPLICATE

Lab Sample ID: RA88A
LIMS ID: 10-14537
Matrix: Soil
Data Release Authorized:
Reported: 06/23/10

QC Report No: RA88-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Chromium	6010B	0.02 U	0.02 U	0.0%	+/- 0.02	L
Lead	6010B	0.4	0.4	0.0%	+/- 0.1	L

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: JFC-Bin1Comp1-052610
MATRIX SPIKE

Lab Sample ID: RA88A
LIMS ID: 10-14537
Matrix: Soil
Data Release Authorized:
Reported: 06/23/10

QC Report No: RA88-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Chromium	6010B	0.02 U	1.06	1.00	106%	
Lead	6010B	0.4	4.5	4.0	102%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample ID: JFC-Bin2Comp1-052610
SAMPLE

Lab Sample ID: RA88B
LIMS ID: 10-14538
Matrix: Soil
Data Release Authorized:
Reported: 06/23/10

QC Report No: RA88-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: 05/26/10
Date Received: 05/26/10

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	06/17/10	6010B	06/21/10	7440-47-3	Chromium	0.02	0.02	U
1311	06/17/10	6010B	06/21/10	**7439-92-1**	**Lead**	0.1	**0.2**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS **Sample ID: METHOD BLANK**

Lab Sample ID: RA88MB
LIMS ID: 10-14538
Matrix: Soil
Data Release Authorized:
Reported: 06/23/10

QC Report No: RA88-Anchor Environmental
Project: Jorgensen Forge
010128-01.01
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	06/17/10	6010B	06/21/10	7440-47-3	Chromium	0.02	0.02	U
1311	06/17/10	6010B	06/21/10	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

APPENDIX D
DATA VALIDATION REPORT

ANCHOR QEA

1423 Third Avenue, Suite 300
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

DATA VALIDATION REVIEW REPORT – EPA LEVEL 3

Project:	Jorgensen Forge Corporation
Project Number:	010128-01.01
Date:	July 28, 2010

This report summarizes the review of analytical results for 5 solid samples collected on May 21, 2010. Samples were collected by Anchor QEA, LLC, and submitted to Analytical Resources, Incorporated (ARI) in Tukwila, Washington. Samples were analyzed for the following:

- Polycyclic aromatic hydrocarbons (PAHs) by United States Environmental Protection Agency (USEPA) method 8270D-SIM
- Polychlorinated biphenyls (PCBs) by USEPA method 8082
- Total metals by USEPA methods 6010B and 7471A
- Total organic carbon (TOC) by Plumb, 1981
- Total solids (TS) by USEPA method 160.3M

ARI sample data group (SDG) number QX51 was reviewed in this report. The samples reviewed in this report are presented in Table 1.

Table 1
Samples Reviewed

Sample ID	Lab ID	Matrix	Analyses Requested
JFC-12S2-052110	QX51A	Solid	PAHs, PCBs, metals, TOC, TS
JFC-12S3-052110	QX51B	Solid	PAHs, PCBs, metals, TOC, TS
JFC-Gasket S1-052110	QX51C	Solid	PAHs, PCBs
JFC-Gasket S2-052110	QX51D	Solid	PAHs, PCBs
JFC-OLMS1-052110	QX51E	Solid	PAHs, PCBs

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the laboratory quality assurance/quality control (QA/QC) limits. Laboratory results were reviewed following *USEPA Contract Laboratory Program National Functional Guidelines for Inorganics Data Review* (USEPA 2004) and *USEPA National Functional Guidelines for*

Superfund Organic Methods Data Review (USEPA 2008) as guidelines, and applying laboratory and method QC criteria as stated in SW 846, Third Edition, *Test Methods for Evaluating Solid Waste*, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ARI at the time of sample receipt; the samples were received at a temperature of 12.8°C. This is outside of the recommended <6°C but since the samples were delivered to the laboratory within 12 hours of collection there was no significant impact on the results. Custody seals were not attached to the coolers because the samples were within Anchor QEA's custody until delivery to the laboratory.

Holding Times and Sample Preservation and Analytical Methods

Samples were appropriately preserved and analyzed within holding times.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Field Quality Control

Rinse Blanks

Rinse blanks were not collected for this sampling event.

Field Duplicates

Field duplicates were not collected for this sampling event.

Surrogate Recoveries

Surrogate recoveries were within laboratory control limits for all surrogates.

Laboratory Control Sample (LCS) and LCS Duplicate (LCSD)

LCSs and LCSDs were analyzed at the required frequencies and resulted in recoveries within laboratory control limits.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD)

MS and MSD samples were analyzed at the required frequencies or LCS/LCSDs were analyzed in lieu of MS/MSDs (when there was limited sample volume). All MS/MSD analyses yielded percent recoveries (%R) and/or relative percent difference (RPD) values within the laboratory control limits.

Initial Calibration

Initial calibrations were analyzed at the required frequencies and resulted in relative response factors and RPD values within the associated analytical method criteria.

Continuing Calibration

Continuing calibrations were analyzed at the required frequencies and resulted in recoveries within the associated analytical method criteria with the exception of a slightly low recovery of benzo(g,h,i)perylene in the PAH analysis on 05/24/2010. All associated results were J-qualified. See Table 2 for qualified results.

Laboratory Duplicates

Laboratory duplicates were analyzed at the required frequencies. All RPD values were within laboratory control limits.

Method Reporting Limits

Reporting limits were deemed acceptable as reported. All values were reported using the laboratory reporting limits. Values were reported as undiluted, or when reported as diluted, the reporting limit accurately reflects the dilution factor. For samples with multiple results, the least technically acceptable result was rejected. See Table 2 for qualified results.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, and MS/MSD %R values. Benzo(g,h,i)perylene recovered high in the continuing calibration and was qualified in all associated positive results. Precision was also acceptable as demonstrated by the laboratory duplicates, and LCS/LCSD RPD values. When more than one result was reported for a sample, the least technically acceptable result was rejected. Most data were deemed acceptable as reported; all other data are acceptable as qualified. Table 2 summarizes the qualifiers applied to samples reviewed in this report.

Data Qualifier Definitions

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.

J Indicates an estimated value.

R Indicates data is rejected and unusable

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

Table 2
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
JFC-12S3-052110	PAHs	Naphthalene	37,000E µg/kg	R	Exceeds calibration upper limit
		2-Methylnaphthalene	13,000E µg/kg	R	
		1-Methylnaphthalene	10,000E µg/kg	R	
		Pyrene	6,500E µg/kg	R	
		Benzo(g,h,i)perylene	950Q µg/kg	950J µg/kg	Low CCV %R
JFC-12S3-052110 Dilution	PAHs	Acenaphthylene	640U µg/kg	R	Use undiluted analysis
		Acenaphthene	2,600 µg/kg	R	
		Fluorene	3,700 µg/kg	R	
		Phenanthrene	11,000 µg/kg	R	
		Anthracene	1,700 µg/kg	R	
		Fluoranthene	2,800 µg/kg	R	
		Benzo(a)anthracene	2,000 µg/kg	R	
		Chrysene	1,900 µg/kg	R	
		Benzo(b)fluoranthene	900 µg/kg	R	

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Benzo(k)fluoranthene	830 µg/kg	R	
		Benzo(a)pyrene	2,000 µg/kg	R	
		Indeno(1,2,3-cd)pyrene	710 µg/kg	R	
		Dibenz(a,h)anthracene	640U µg/kg	R	
		Benzo(g,h,i)perylene	1,200Q µg/kg	R	
		Dibenzofuran	1,000 µg/kg	R	
JFC-Gasket S1-052110	PAHs	Benzo(g,h,i)perylene	99,000Q µg/kg	99,000J µg/kg	Low CCV %R
JFC-OLMS1-052110	PAHs	Naphthalene	4,200,000E µg/kg	R	Exceeds calibration upper limit
		2-Methylnaphthalene	2,000,000E µg/kg	R	
		1-Methylnaphthalene	1,300,000E µg/kg	R	
		Phenanthrene	3,300,000E µg/kg	R	
		Fluoranthene	980,000E µg/kg	R	
		Pyrene	2,400,000E µg/kg	R	
		Benzo(g,h,i)perylene	280,000Q µg/kg	280,000J µg/kg	Low CCV %R
JFC-OLMS1-052110 Dilution	PAHs	Acenaphthylene	71,000U µg/kg	R	Use undiluted analysis
		Acenaphthene	310,000 µg/kg	R	
		Fluorene	610,000 µg/kg	R	
		Anthracene	420,000 µg/kg	R	
		Benzo(a)anthracene	480,000 µg/kg	R	
		Chrysene	480,000 µg/kg	R	
		Benzo(b)fluoranthene	210,000 µg/kg	R	
		Benzo(k)fluoranthene	210,000 µg/kg	R	
		Benzo(a)pyrene	490,000 µg/kg	R	
		Indeno(1,2,3-cd)pyrene	200,000 µg/kg	R	
		Dibenz(a,h)anthracene	79,000 µg/kg	R	
		Benzo(g,h,i)perylene	330,000Q µg/kg	R	
		Dibenzofuran	110,000 µg/kg	R	

Notes:

CCV =continuing calibration verification

REFERENCES

USEPA. 1983. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. EPA 600/4 79-020.

USEPA. 1986. Test methods for Evaluating Solid Waste: Physical/Chemical Methods. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA 530/SW-846.

USEPA. 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation (OSRTI). EPA 540-R-04-004. October.

USEPA. 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. USEPA 540-R-08-01. June.